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Portable Gas Light.

Nearly two hundred years ago the Rev. John Clayton, of Yorkshire, England, in a paper read before the Royal Society of England, called the attention of the world to the practicability and advantages of the manufacture of an artificial light from coal.

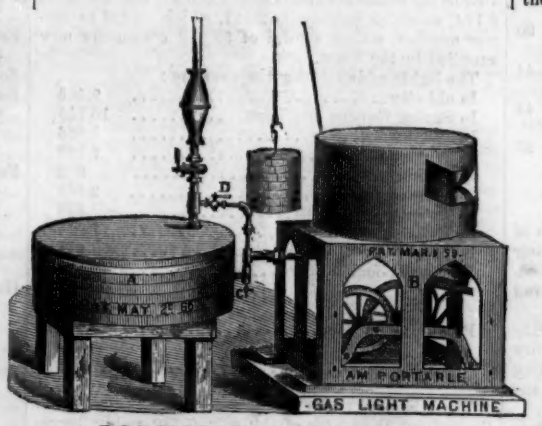
The idea was ridiculed, and for more than a century this discovery remained without a successful effort to render its practicability useful; indeed, for many years it seems to have been but little spoken of, except by an occasional lecture by chemists, or in some scientific treatise. The people being slow to conceive new ideas or make changes, preferring to retain and suffer the inconveniences of the well known illuminators used by their ancestors, and regarded it as fallacious to attempt to improve on the rush light, the tallow dip, or illuminating oils. And the suggestion was treated by all classes as one of those discoveries likely to remain more amusing than useful.

In the latter part of the last century the experiment was for the first time successfully made, of passing the gas through pipes, and burning it through metallic jets, thus producing an illuminator vastly superior to any at that time known. Notwithstanding the success of this experiment and the entire confidence reposed in it by many scientific men, it was not until the year 1813 that it was first introduced in the streets of London. Like all new experiments, it met with the usual amount of opposition, and had more than the usual amount of prejudice to overcome. The timid saw in it nothing but a more rapid and improved mode of securing a general conflagration, and the fastidious found in its offensive odor and great impurities an unanswerable argument against its introduction into their dwellings, or even permitting the public highways to be illuminated by it—preferring to wander in the dark to resorting to an illuminator which they deemed unhealthy, disagreeable and dangerous. To show how far this prejudice was carried, even among scientific and intelligent minds, the celebrated Sir Humphrey Davy prepared and published an elaborate treatise characterized with more than his usual ability and scientific research, to prove the danger of introducing so inflammable and explosive an article as heavy carbonated hydrogen into the streets and dwellings of a large city; assigning as his reason that there would be constant and continued explosion and conflagration from its use; that the health of the metropolis would be greatly injured, and the property therein rendered valueless.

The insurance companies and fire associations united their voice to the general clamor, and by their factious opposition, for many years prevented the introduction of the valuable boon of light to their benighted fellow-citizens.

We have not space to enter into a detailed account of the efforts finally successful by which these prejudices were overcome, and this illuminator successfully introduced throughout the world.

Recent experiments and discoveries have demonstrated that the heavy carbonated hydrogen (coal gas) can be wholly dispensed with as an illuminator, and that oxygen taken from the air will, in connection with hydro carbon, secure an illuminator free from all the dangerous perils from fire and suffocation of the gas heretofore used, and that it can be produced at a price less than one-fourth of the cost of the several gases now in use. This desideratum has been attained by the materials and machinery now being introduced by the American Portable Gas Light Company.



PORTABLE GAS LIGHT.

It is automatic clock work or motive power, which is propelled or controlled by weights. It is wound up the same as a clock, and the motion of it is regulated by the number of burners lighted. The machinery, working at right angles, works a pair of bellows, which pumps air into an airometer, which is about 20 inches in diameter, and 14 high. By a pipe the air passes into the carburator, which contains the hydro-carbon, which acts in perfect harmony with the oxygen of the air, and has such a strong affinity for it, that it produces gas immediately, without either the aid of fire or heat. The gas is then conveyed through piping to the burners, the same as in ordinary street gas, the same as when it passes through the meter, etc.

THE CARBURATOR

Is an apparatus distinct from the air machine, and can be attached to the machine as shown at A, in the small engraving, or be placed more or less remote from it, as shown in the second engraving. The carburator can be used also to enrich common coal gas, by passing the gas through it without the aid of the air machine B. This carburator is a vessel divided into a series of compartments and serpentine channels, and filled with a porous substance to absorb the hydrocarbon and increase the evaporating surface greatly thereby. It also prevents any accidental leakage or spilling of the fluid, and enhances the safety of the apparatus.

Messrs. Monroe & Smith, 31 Courtlandt street, N. Y., are general agents for the company, and will give further information upon application.

Burning Oil.

On this subject the Erie *Dispatch* speaks of the alarming frequency of accident or loss of life from the explosion of kerosene lamps, and says the cause is known to oil refiners, many of whom are as honest men as there are in the country, and who would be richer if it were not for being compelled to compete with swindlers in the business, but it is not generally known to the public that a large proportion of the oil now sold for illuminating purposes, under the name of "kerosene," is an inferior compound, manufactured from the odds and ends of refuse, worked up, after the pure illuminating oil has been obtained. These compounds are highly explosive, being quite as dangerous as gunpowder, and in the hands of ignorant persons inflict much injury and loss upon the community. In the distillation of petroleum oil, a volatile fluid known as naptha, is produced in large quantities. Owing to its explosive or easily burned quality, this naptha is rejected by the distillers of pure oil, and in consequence it is sold at a very low price to druggists or manufacturers of paints, by whom it is used for various purposes. Owing to its low price this fluid is also purchased by unscrupulous manufacturers of burning fluid, who, by mixing it with other ingredients, produce a burning fluid which ought to be prohibited by legal enactments. In Congress, some have already mooted the question of submitting all illuminating oils to a test, which will define their explosive qualities. Although this is a very good mode for preventing loss of life and property, it does not entirely meet the requirements of the case. What is wanted, is more stringent laws against the manufacture of those illuminating oils from substances known to be explosive, under certain chemical conditions. Petroleum oil can be distilled in a manner that will render it quite as harmless as sperm or lard oils, and some refiners assure us that, if the oil is properly converted into illuminating oil, it will stand the test of having a lighted torch thrust into the barrels, without risk of explosion.—*Pithole Record.*

Philadelphia Gas Works---Report.

At a rather late period we are in possession of the Thirty-second Annual Report of the Trustees of the Philadelphia Gas Works. We are gratified to observe that the past year has been more profitable than the preceding one, and that the affairs of the Trust generally are in a good condition.

Without going into details which would not be interesting, we extract from reports of the President, Engineer and Cashier, sufficient to show the principal facts of interest:

To the Select and Common Councils of the City of Philadelphia:

The trustees of the Philadelphia Gas Works make this their thirty-second annual report, in conformity with the ordinances for the construction and management of the Philadelphia Gas Works.

The Contingent Fund of the Trust which has been used in the extension of the various works amounted on the 1st day af January, 1867, to the sum of $1,130,900.97.

The Engineer's report, hereunto annexed, gives in detail the amount of gas that has been made during the year, the amount of coal carbonized, the length of the street mains laid during the year, and the entire length of pipes now used by the Trust.

On the 1st of January, 1867, the whole number of public lamps under the care of the Trust was 7,622, of which number 15 were lighted with fluid or oil. The amount paid by the city for lighting and cleansiug the lamps for the year 1866 was $417,295.11; the loss to the Trust amounted to the sum of $102,379.41.

On the 1st of January, 1866, there remained of the loan, passed December, 1864, the sum of $756,400; the amount of the loan expended during the year, in extending the works, etc., amounted to $344,700, leaving unexpended of that loan, on the 1st day of January, 1867, the sum of $411,700, out of which is due the Trust $140,000, for cash expended.

Loan No. 4 became due on the 1st day of January, 1866, amounting to the sum of $125,000, and was paid out of the sinking fund.

The trustees report that they have observed all the ordinances of council in relation to the sinking fund.

From the report of the Engineer it appears that the amount of coal used during the year, cost the Trust an average of $9.15, and amounted to 109,259 net tons.

In January, 1866, a fire occurred at the Point Breeze Gas Works from spontaneous combustion, and the Engineer reports a loss of 5,931 tons.

The Engineer has, during the year, erected coal-sheds at the Ninth ward works at a cost of about $20,000, which will save the Trust in the item of hauling and labor of at least $15,000 a year.

From the report of the Cashier, hereunto annexed, it appears that the gross profits of the Trust for the year 1866, amounted to $392,059.37. From these profits were paid:

Interest on gas loans	$162,387 00
For the sinking fund	69,529 00
For 8 per cent. on $450,000, the valuation of Spring Garden and other gas works	36,000 00
For interest on stock of the Southwark, Moyamensing, and other gas companies	24,005 44
	$291,921 44
Showing a gain on the business of the year of	$100,137 93

ENGINEER'S REPORT.

To the Trustees of the Philadelphia Gas Works:

GENTLEMEN: In compliance with the requisition of the by-laws of the Board, the Engineer presents to your honorable body the thirty-second annual report, detailing the condition of the works confided to his care, and the operative results of the same for the year 1866.

There has been manufactured during the year, 915,956,000 cubic feet of gas, being an increase in quantity over the year 1865 of 71,440,000 cubic feet, or nearly 8¼ per cent., making the aggregate production of the works, since their erection, 9,460,299,000 cubic feet.

The operations of the several manufacturing stations have been as follows:

	Cubic feet.
Gas made at the 26th Ward works	409,881,000
" " 9th " "	356,139,000
" " 15th " "	136,329,000
" " 21st " "	13,607,000
Total	915,956,000

The amount of coal carbonized and gas made in iron and clay retorts was as follows:

	Coal carbonized. Gross tons.	Gas made. Cubic feet.	Gas made per ton of coal. Cubic feet.
Iron retorts	89,881	848,066,000	9,435
Clay retorts	7,672	67,890,000	8,849
	97,553	915,956,000	9,389

The maximum consumption in twenty-four hours was 4,129,000 cubic feet, which occurred on the 24th of December.

The materials and quantities thereof used in the manufacture and purification of gas, and other statistics, are exhibited in the following statement:

	Gross tons.	Net tons.
Coal in store, Jan. 1. 1866	16,526	18,509
Coal bought in 1866	100,478	112,535
	117,004	131,044
Coal used in 1866	97,553	109,259
Coal destroyed by fire	5,296	5,931
Coal on hand, Jan. 1, 1867	14,155	15,854
	117,004	131,044

Lime used, 193,612 bushels.

	Bushels.
Coke on hand, January 1, 1866	34 400
Coke made in 1856	3,419,914
	3,454,314
Coke used under retorts in 1866	1,920,226
Coke used for pumps, exhausters and lime kilns	126 463
Coke used in offices, yards and streets	29,341
Coke sold in 1866	1,202,843
Coke on hand, January 1, 1867	175,441
	3,454,314

The number of meters and service pipes introduced during the year has been as follows:

In limits of old city	328
" Spring Garden and Penn	887
" Moyamensing	312
" Southwark	147
" Richmond	77
" Kensington	256
" Twenty-first Ward	43
" Twenty-second Ward	82
" Twenty-third Ward	56
" Twenty-fourth Ward	161
In all	2349

Adding to which the number of meters and services before in use, makes the number of meters in use 52,293, and service pipes 52,408.

The applications for gas registered during the year have been:

At Seventh street office	5,910
At Spring Garden office	3,670
At Twenty-first Ward office	139
At Twenty-second Ward office	248
At Twenty-third Ward office	137
At Twenty-fourth Ward office	512
In all	10,625

Deducting removals and discontinuances, amounting to 8,174, shows an increase of 2,451, which added to former number, makes a total of 52,938 consumers now supplied by the Trust.

The lights added during the year are:

In old city	9,403
In Spring Garden and Penn	10,715
In Southwark	1,356
In Moyamensing	2,792
In Richmond	802
In Kensington	2,583
In Twenty-first Ward	656
In Twenty-second Ward	1,610
In Twenty-third Ward	611
In Twenty-fourth Ward	2,698
	33,226
Previously in use	617,770
Total	650,996

There is now, under the charge of the Trust, placed throughout the wards of the city, 7,180 public lamps supplied with gas from the works, 427 from Northern Liberties Works, and 15 with fluid, making a total of 7,622.

There has been an increase in the yield of coal, of 259 cubic feet of gas to the ton in iron retorts, and 1,189 cubic feet in clay retorts. The increase in iron is owing mainly to the better quality of retorts, and in the clay to an improvement in the mode of setting them.

CONSTRUCTION OF WORKS.

The improvements made in the twenty-sixth ward works, during the year 1866, consist of a new retort house, 250 feet long, 60 feet wide, and 52 feet high from the foundation, with benches for 240 retorts in settings of five retorts to a bench. The mason work on this building is finished excepting the porches or wing building, the skeletons of one section of benches is complete, and the other nearly so. A purifying house 116 feet long and 60 feet wide has been completed, and two sets of 20 feet square purifiers are now being placed in them; attached to this building is an exhaust and engine house 32 feet by 48 feet.

To connect these buildings with the meters 1,038 feet of 18 inch main has been laid with the necessary valves, as also 970 feet of 4 inch and 12 inch water main for supplying and draining the buildings. A meter 12 feet diameter, larger than any now in use in this city, has also been added, capable of passing one and a half million of cubic feet of gas every twenty-four hours. The old pump exhausters have been removed and a large rotary exhauster substituted in their place.

At the ninth ward works the improvements conbist of a coal store house, 240 feet long and 70 feet wide. The upper part of this store house is of the same grade as the Pennsylvania railroad, and the coal from the cars is dumped through traps in the floor to the coal pile immediately adjoining the retort house, thereby saving a great expense of carting and labor in handling the coal. The coal is kept under cover and free from dirt and exposure to the elements.

No improvements were made at the fifteenth ward works during the year.

At the twenty-first ward works they consist of a new purifying-house and the extension of the retort house. The purifying-house is 46 feet long, 34 feet wide and 20 feet high, with a capacity of 225,000 cubic feet every twenty-four hours The extension of the retort house consists of five benches of three retorts each.

The improvements at the twenty-third ward works consists of an additional gas-holder and a new engine and exhausting house, which are being completed as rapidly as possible.

DISTRIBUTION.

This department has been very busy during the year.

The following is the total quantity of main pipe laid during the year, 53,945 lineal feet, making the aggregate length of main pipe, now belonging to the Trust, 2,566,612 feet, or over 486 miles.

REPAIRS.

There has not been more than the ordinary repairs during the year.

The tabular statements of the several accounts hereunto annexed present a faithful exhibit of the operations of the works during the year.

CASHIER'S REPORT.

To the Trustees of the Philadelphia Gas Works:

Gentlemen: Your cashier has the pleasure of submitting to you the annual statement of the condition of the finances of the Trust for the year 1866, and in stating that the net profits of the business for the year have been $100,137.93, and would have been a great deal more if it had not been for the great loss sustained by the Trust in lighting, cleaning, repairing and extinguishing of the public lamps. If the Trust could be paid a reasonable amount for this, they would be enabled to reduce the price of gas to the private consumer.

The accounts are as follows:

The gross profits of the year amount to		$392,059 37
The appropriations for the year were:		
For interest on gas loans, including that payable at the city treasury	162,387 00	
For the sinking fund for all the gas loans	69,529 00	
For 8 per cent. on $450,000, the valuation of the Spring Garden, Moyamensing, West Philadelphia and Frankford Gas Works	36,000 00	
For interest on the stock of the Southwark, Germantown, Manayunk and Richmond Gas Companies, and appropriations to their several sinking funds	24,005 44	
	$291,921 44	
Gain to the business of the year	100,137 93	
	$392,059 37	

BENJ. S. RILEY, *Cashier.*

BOARD OF TRUSTEES FOR 1867.

President, Nathan Hilles; Trustees, Nathan Hilles, William H. Barnes, James McManes, Chas. A. Miller, John Manuel, William Elliott, Joseph M. Cowell, William R. Leeds, M. Hall Stanton, Geo. I. Young, Chas. E. Graff, John A. Houseman; Engineer, Joseph Manuel (elected March 10, 1865); Cashier, Benj. S. Riley (elected Nov. 3, 1865); Registrar, Samuel M. White (elected March 24, 1865).

We observe that the Trust have lately reduced the price of gas to $2 70 per 1000 cubic feet net cash.

—When charcoal has not absorbed moisture and is mixed with oxydizing substances, it may be inflamed by violent shocks or by friction.

—A rapid penman can write thirty words in a minute. To do this he must draw his quill through the space of sixteen and a half feet.

Important Communication Concerning Gas!

From H. W. FITCH, Secretary of the Gas Company.

A Full and Complete Answer to the General Complaints made against the Company—Interesting Statistics.

The consumer contracts with the company for a supply of gas, to be determined by the meter; and upon its registrations his bills are made out. With but few exceptions the bills of all companies have endorsed on them ample instructions for "taking the state of the meter" so plainly setting forth the manner that anyone able to read could readily take the statement, though he had never seen one before. The bill being presented in the winter, it is more than probable the consumer is astonished at the amount. It is larger than the bill for the previous month—complaints that the bill is smaller than expected, are never heard. He has not burned his gas any later at night than he has for months past; has had the same number of burners in use, and concludes did not burn any more gas. Examines his bills for several months past, and finds they have been increasing every month, with a constantly increasing ratio or progression, inquires mentally what his bill may amount to six months hence, at same ratio of increase; hurries to the gas company's office, arriving there, more than five chances to one, in an angry mood, with a triumphant air spreads his bills out on the counter, declares to the last to be the largest bill he ever had—"did not burn any more gas than usual"—puts his burners out the year round at half-past 9 o'clock—finds his bills doubling up every month—intimates that his "business won't afford such expenditure,' and knows that "it is impossible for him to burn so much," when, half out of breath, he gives opportunity for reply. It is an old story to the clerk, who has probably heard it ten thousand times before, from every variety of occupation and character of consumer—from mammoth wholesale bazaars and unpretending peanut stands—from the largest hotel and the smallest vender of cakes and pies—bankers and boot blacks, the palace and the cottage, and in every shade of emphasis—in English, broken by every variety of tongue known or heard since the disaster at the Tower of Babel, and delivered with every conceivable gesture. It is but an ordinary matter of business with him, and he views the situation with evident composure. The irritated complainant at once construes his equable temper and lack of surprise into studied indifference as to his honestly conceived wrongs, and consequently becomes more restive, perhaps violent in his language. With a degree of courtesy unexpected, and unusual in any other business, under like circumstances, the clerk reminds him of the season. It is winter. Though he uniformly puts his light out at 9½ o'clock, he as uniformly lights it at dark, which in July is 8½ and in January 5½ o'clock. That everything being even, his bill in January ought to be at least four times as large as that of July; and by examination finds that proportion between them, looks back a year, and finds that the gentleman's bill for the corresponding month was even larger, and suggests that the amount charged was more than probably correct. The consumer being angry, and, as a consequence, unreasonable, hints something about "monopoly," and threatens to abandon the use of gas. Is reminded that such a course would prove that the company is not a monopoly; for it does not control all the means for artificial light. On this thought he gets better natured, and is further reminded that the gas was supplied by contract, to be determined by a meter: and not what *he thinks* he burns, or by the comparison of one bill by another; that he has the meter on his own premises, and virtually makes his own bills.

He then objects, probably, to the meter. Is assured that it is correct, but if not satisfied, may procure one for himself, of any established manufacturer, and the company will supply him by its measurement. Possibly he them remembers of his having done so, some three years ago (instances have been known) and concludes to pay the bill, inasmuch as it was determined by his own meter. Notwithstanding this fact, and his recollection of having had the same trouble every previous winter, he persists in saying that "it must be wrong." Another consumer, who has perhaps been attentively listening to the conversation just closed, "knows that his bill is wrong, for he has only five burners: the bill is for 5,500 cubic feet, and it is out of the question for five burners to use so much in a month." The clerk tells him that five moderate burners could consume 21,600 feet in a month if used all the time; thinks it probable that he has used them over one-fourth of the time, or six hours per day, and that possibly his burners are so defective as to use more than is necessary.

So it runs in every gas company's office the world over—the majority of consumers losing entirely all remembrance of their contracts to take gas by measurement, and complaining that they cannot, with all the data loosely guessed at, estimate the quantity of an invisible fluid with more accuracy than it is measured by a well constructed and mathematically adjusted machine.

If, however, a consumer has reasonably good burners, such as will permit a full pressure without blowing or making a noise, and will make a fair calculation of the hours he has used them, and compute their consumption at one cubic foot more than they are marked, (for they will generally consume that much more than they are marked), and if the quantity thus estimated does not approximate closely to that indicated by the meter, it is reasonable to look for other causes of consumption, and will, without doubt, find it in a leaking pipe, or that another tenant, in the same house, has been using it without his knowledge. A satisfactory reason is as certain to be ascertained as it is positive that the indicated quantity is more than may be estimated for the known points of consumption. In many years of experience and hundreds of cases, we have not an instance but what on examination has been easily accounted for.

A remedy for this class of complaints has been sought in many cities by the appointment of a Meter Inspector as a city officer. This course is everywhere more desirable to the gas company than to any class of consumers. There is no company but what would cheerfully have its meters examined and reported by a competent inspector, and it would be of great advantage and satisfaction to them could there be competent and official authority to which reference could be made in all cases of dispute. On experiment this course has seldom proven desirable to either consumers or the officer—they regarding it as in effect legislating the amounts charged them, and the officer, finding it unpleasant to act as umpire where there should be, and is no necessity for one.

Another most prolific and irremediable source of complaint is the price of gas; and in point of universality, this reason forms no exception to others mentioned. Wherever gas is sold there is complaint, and a large proportion of consumers everywhere find it too high, whether at 5s 6d in Manchester, England, or $9 (in coin) as in Sacramento, California. The price charged makes but little difference as to complaint, if any, the higher the rate the less the grumbling. In this country especially it would be found true to-day, or of any time in the past, on rigid examination, that in those cities where gas is supplied at the lowest prices; and with companies that at such periods as they supplied it at their minimum prices, there is, and has been, the most complaint of the price.

It is worthy of mention in this connection that out of near six hundred gas companies in the United States, less than one hundred and fifty are paying six per cent. on their value or cost of construction, and many are being operated at an absolute loss, as a matter of convenience to their stockholders, who are consumers.

As to the price charged in this city, there has been so much misrepresentation that we beg to make comparison with some other places. It has become a stereotyped expression, with some classes, that the people of Memphis are charged more for gas than the people of any other city on the continent.

The net price charged by this company is $5 50 per 1,000 cubic feet with no meter rent. The price in St. Louis is $4.50, the consumer purchasing the meter. In Nashville, $4.50; in Mobile, $5; Natchez, $6; Vicksburg, $6; New Orleans, $4: (are restricted to this price by their charter, or would charge $6;) Charleston $7, (but contemplate a reduction to $4, in gold;) Montgomery, $8; Macon, $8; Galveston, $8; San Francisco, $6, in coin; and Sacramento, $9 in gold, (payable weekly on presentation of the bill).

The expense of supplying gas is much greater in this city than in many of the above named places, by reason of leakage, etc., consequent upon the character of the streets in which supply pipes must be laid. In few cities are there so few consumers for the same extent of pipe laid. Condensation and leakage are about the same on a given extent of pipes, whether it supplies few or many consumers.

(To be continued.)

PEAT FOR THE MANUFACTURE OF GAS.—At the Glen's Falls gas works, Troy, N. Y., the experiment of substituting peat for coal has been tried with considerable success. The *Troy Times* says that one hundred and fifteen pounds of dried peat taken from a bed not more than three feet below the surface, yielded seven hundred and eighty-four feet of gas, or five and eighty one hundredths of gas to the pound, while from the best coal used at the works the yield of gas does not exceed four feet and forty one-hundredths to the pound. The cost of peat is much less per ton than that of the coal usually employed in the manufacture of gas.

[FROM THE NEW YORK HERALD OF MARCH 15.]

Croton Water.

Its Reckless and Useless Waste—How it Occurs—Facts as to the Consumption of Croton—Will the supply be Sufficient for the Increase of Population?—Remedial Measures a Necessity—New Works Contemplated by the Croton Board, &c.

From what has been said above it will be readily seen that every precaution has been taken by the Department to prevent in the future any lack of supply to the city, even if the increase of population in the metropolis should exceed by far the ratio now contemplated. The present means of furnishing water are in fact of themselves amply sufficient for introducing into the city enough for the wants of twice its present inhabitants, if the alarming waste could be summarily stopped; for it is from this cause alone that any fears need be apprehended. The acqueduct from Croton lake is capable of conveying hither, daily, about sixty millions of gallons. This is the capacity of the work for permanent use every twenty-four hours, though, if put strictly to the test, more than this quantity can be forced through it. At the time of the burning of Mr. Chittenden's property in Broadway, the firemen made complaint that the force of water was not sufficient to supply the apparatus engaged in subduing the conflagration. At this time, however, there was coming through the acqueduct sixty-two millions of gallons of water every day, the extra two millions being forced through daily about that time by way of testing the capacity of the work. Were it not for the reckless waste that occurs every twenty-four hours, therefore, there would have been no lack of material with which to quench the flames. The water used at fires is, in fact, nothing as compared to the quantity daily allowed to run uselessly into the sewers from manufactories, dwellings, &c., which quantity is estimated as high as two-thirds of the whole bulk received per diem. A careful estimate says that twenty millions of gallons run into the harbor diurnally, lost to the honest and economic consumers, and every gallon of which has to be paid for by the already heavily burdened taxpayers of the metropolis.

Considerations such as these have led to the inquiry now circulating among thoughtful citizens whether, if this reckless extravagance in the misuse of water be further permitted, there will not be a degree of inconvenience, if not of suffering, experienced by those who have a right to demand a sufficiency of the fluid for all necessary purposes. Many suggestions have been made in this regard, but the almost universal sentiment appears to be that the water should be measured and charged for according to the quantity used. The water meter may have a tendency to stop the waste, but a difficulty will doubtless be experienced in the selection, out of the two hundred and forty already patented, of one which will combine the requisites of accuracy, durability and cheapness. It is impossible to give the present amount of waste with anything like certainty; but one thing is sure—every few years the consumption of water is doubled, though the population does not increase in a ratio in anywise proportioned to this augmentation of the water supply demanded. A family requires no more food this year, provided its number has not increased, than it did last. The individual consumption of gas is not increased yearly; why, then, should the average amount of water furnished keep continually increasing *per capita*? Some persons argue that the fairest means of furnishing water is to place receptacles in each dwelling, manufactory, &c., proportioned in size to the number of consumers, or to the carrying on of such business as require its use, and that beyond this quantity, fairly estimated, no further supply per diem be furnished. In London this system is enforced, and with the most beneficial result. There the water is let on between cercain times in the morning, and at the expiration of the time allowed it is shut off—the receptacles or tanks above referred to being supposed to have been filled meanwhile. This *modus operandi* gives each person an average of thirty gallons, and this quantity is set down as the maximum that will satisfy all necessary demands for drinking, cook-

ing and ablutory purposes. As showing a marked contrast to this, we have authority for saying that in two cases in this city, where water meters were used, the following facts were brought to light: One family of only four persons were found to have used (and wasted) during twenty-four hours, two thousand gallons (over thirty-one hogsheads); another family of like number used, by meter measurement, one thousand eight hundred gallons, or over twenty-eight hogsheads—this, be it remembered, was consumption for mere home purposes.

The legitimate consumption of water may be classed under five heads, viz: 1. The wealthy, who live in large and roomy houses; 2. The poorer families, who reside in tenements; 3. Manufacturers, including distillers, brewers, &c.; 4. Water for the supply of shipping; 5. Water used for the extinguishment of conflagrations. The present means of supply for all these purposes is amply sufficient, and would be if the demand were doubled, could an end be put to the improvident waste, in some cases absolutely wilful, which now characterizes its use in this city. This is a matter which calls loudly for legal interposition, and if it be not taken in hand, we may feel the ill effects of the evil sooner than many anticipate.

(To be continued.)

On the Igniting Point of Petroleum.

By John Attfield, Ph.D., F.C.S.,

Director of the Laboratory of the Pharmaceutical Society of Great Britain.

But to proceed to show why a given specimen of petroleum may be observed to ignite at various temperatures.

The time employed in the operation of taking the igniting-point of petroleum, as usually performed, is the first cause of variation to which I shall allude. About two ounces of a specimen of petroleum marked "Ladoga" was placed in a small dish or capsule about five inches wide and one inch deep, and very slowly warmed by a gas lamp, a small flame being passed near to the surface of the liquid every quarter or half minute. The liquid was stirred with the bulbed end of a thermometer, the temperature rising at the rate of about a degree per minute. In this way the experiment was carried on until at 124°, as marked on the stem of the thermometer, the petroleum vapor ignited, and the liquid also ignited at the same instant. A similar experiment was performed on a fresh specimen of the same oil, except that the temperature was quickly raised, ignition of the vapor took place at 90°, and the oil itself took fire at 111°. It would seem that the highly volatile portion of the petroleum, the portion which forms inflammable vapor, soon escapes when the oil is heated in an open vessel, leaving a liquid less inflammable than before. We know, from the researches of Ronalds, Schorlemmer, Pelouze, Cahours, and others, that petroleum, utterly unlike sperm, colza, olive, and other old burning oils, is a mixture of a large number of liquids of different degrees of volatility, and, indeed, containing bodies which when isolated are permanent gases; hence the above result might have been expected.

The rate of escape of vapor from the oil and from the operating vessel is another cause of variation in the igniting-point. Some of the same "Ladoga" oil was treated as already described, except that it was heated somewhat quickly, and was only stirred just before taking a reading of temperature. This time ignition occurred at 98°. Stirring, as is well known, promotes the escape of vapor from a liquid, and in this case also by causing eddies or currents of air promotes its escape from the surface of the liquid.

The form of the vessel in which the petroleum is heated, by accelerating or retarding the escape of vapor, also causes variation in the igniting point. Some "Ladoga" oil was heated gradually but quickly in a wide-mouthed bottle; the mixture of petroleum vapor and air thus formed in the upper part of the bottle gave indications of ignition at 92°, and fairly burnt at 94°, several degrees below the igniting point in an open vessel.

The arrangement of the vessel over the source of heat of course influences the result. If a dish, &c., be so placed that its upper walls, not covered by the liquid, become much hotter than the lower portions, then the petroleum stirred up on to the hot part is quickly converted into vapor and ignites, while perhaps the liquid itself is comparatively cool. This is simply bad manipulation, and any one making an error of this kind should not be trusted with the performance of such experiments. Making the experiment in a deep glass beaker, or wide-mouthed glass bottle, and so frequently introducing a large test flame, that the upper part of the vessel becomes full of the products of combustion to the exclusion of much of the air, would, of course, be equally bad manipulation. It is, perhaps, unnecessary to allude to these causes of variation, but that many of those to whom these remarks are addressed deal much in petroleum, but have no knowledge of practical chemistry. The usefulness, therefore, of the observations must be the excuse if they are trite and commonplace.

Shaking with air causes great variation in the igniting point of a specimen of petroleum. A fresh specimen of the same refined "Ladoga" oil was gradually warmed in a bottle, the specimen being violently shaken before the test flame was introduced. In this way explosion actually took place at 78° F. This was an extreme experiment, but it serves to show the influence which more or less shaking or, so to speak, washing out of the vapor from the oil by air, exerts on the point of ignition. It is true that when once in a lamp petroleum is not likely to be much shaken about, yet there are other circumstances under which violent agitation may take place; it is only fair therefore that in taking the point at which a specimen of petroleum evolves inflammable vapor, some amount of stirring or agitation should be practiced.

The distance of the test flame from the petroleum may cause variation in observing the igniting-point. The amount of vapor evolved in a given time may be sufficient to form a small quantity of explosive mixture near the surface of the petroleum, but not an inch or two from the surface; hence an operator dipping the test flame down to the surface of the liquid, or even below the surface, to see if the oil will extinguish instead of being ignited by his flame, will give a lower igniting point of the vapor than an operator who only brings his test flame within an inch of the surface of the oil in a basin, or only just within the mouth of a bottle or gallipot. In an experiment with the "Ladoga" oil this cause of error made a difference of 4° in the observed igniting point.

The amount of petroleum operated on in comparison with the size of the vessel in which the operation is performed will, of course, influence the observations, for the reasons just stated. An operator making his experiments in a bottle or deep beaker or gallipot, and always introducing the test flame only just within the mouth, will sooner meet with the explosive mixture if the vessel is three-fourths full, than if that mixture has first to fill the upper part of a vessel only one-fourth occupied by the liquid.

These, then, are causes, amply sufficient in number and nature, of the variation in the igniting-point of petroleum, as observed by different experimenters, or by the same experimenters at different times. They fully explain the fact that I have found a specimen of petroleum to ignite at almost any degree between 78° and 124°F. Before proceeding to suggest a modified method of observation which shall give constant results, it may be instructive to give a table of the igniting-points of several specimens of refined petroleum recently circulating in wholesale and retail commerce,* the experiment on each specimen being taken under three conditions:—first, heating in an open earthenware bowl, of the form, &c, already described; second, heating in a two-ounce, wide-mouthed, white glass phial, without shaking the petroleum; and third, as the second, except that before introducing the test flame the stopper was inserted in the bottle, and the whole well shaken for three or four seconds. It will be noticed that differences in the igniting point in any one specimen are obtained varying from ten to thirty degrees. The other causes of variation already alluded to were excluded by the experiments, being all performed by one operator of experience, each set of experiments being made under equal conditions, and each experiment occupying the same amount of time—about three minutes. The table will also serve to show what the *Lancet* showed (March 29, 1862) in regard to mineral oils sold in London, and what the observations of O'Neill showed at Manchester in June 1862 (*Chemical News*, vol. v. p. 312), and of Tate at Liverpool, in September 1862 (*Pharmaceutical Journal*, vol. iv., new series, p. 150), namely, that much of the petroleum supplied to the public is dangerous. In addition it shows that, as much of it (in the words of the Act) "gives off an inflammable vapor at a temperatnre of less than 100 degrees of Fahrenheit's thermometer," the law has not yet had the effect anticipated, namely, the exclusion from retail trade of that quality of petroleum which is so badly refined as to have dangerous, because unsuspected properties.

Table of Gravities and Igniting Points of Commercial Petroleum.

Name, brand or distinctive mark.	Specific gravity (water =1000.)	Igniting point of vapor in degrees Fahrenheit. In bottle. In open bowl.	Without agitation.	With violent agitation.
Woodville	796	80	76	70
A.	797	98	83	78
Standard	798	96	95	85
Cayuga	798	81	80	70
B.	799	101	87	71
Denmark	799	94	86	85
Hutchinson	800	90	86	84
Lucifer	801	91	81	78
American Paraffin Oil	801	92	80	68
Commercial ..	803	104	81	79
Am. Petroleum No. 1	804	134	134	111†
" " No. 2	805	93	90	74
" " No. 3	806	83	76	66
Common Paraffin Oil	806	105	90	83
Brilliant . .	808	83	76	66
Young's Paraffin Oil (not a petroleum)	·819	116	97	91

*For the former I have to thank Messrs. Rose, Graham & Wilson, of Threadneedle-street.

† This is an interesting specimen. Its light color, both when purchased and after being exposed to the light for some time, and its specific gravity, indicate that it really is a petroleum, and not a paraffin oil. It was purchased at a retail shop in Drury-lane, London, as "our best, 4½d. per pint." Another quality, sold at the same shop at 4d. per pint, had a higher specific gravity, 806, but much lower igniting-point. Tried in the manner recommended at the end of the paper, the "best" gave off inflammable vapor at 114 degrees, the other at 85 degrees. The properties of this sample prove, or at least indicate (for I could not get at the history of the bulk), that it is easy to supply the public with a perfectly safe petroleum at a reasonable price—a petroleum so low in specific gravity as to readily ascend a wick, and so high in igniting-point as not to be dangerous under ordinary circumstances.

Brevities.

—Twelve thousand tons of sugar was produced at the Sandwich Islands in 1866.

—Carbolic acid, as a disinfectant is unrivalled. Several experiments have recently shown that the virus of rinderpest mixed with a trace of this acid, becomes incapable of transmitting the disease.

—A section of a red-wood tree from California intended for the Paris Exposition, has reached the Department of the Interior. It is eight feet in diameter, and two and a half inches thick.

—The largest tunnel in the world is known as the Box Tunnel, on the Great Western Railway in England. This tunnel is 9,680 feet long, 30 feet high and 35 feet wide.

—At Wyoming an oil locator has found a spot where oil may be obtained at 500 feet, and a company has been formed and capital subscribed, sufficient to sink the well 1,000 feet if necessary.

—It has been ascertained that nitrogen in large quantities is so necessary to the life of plants, that vigorous vegetation cannot take place if there is no other supply of nitrogen than the air.

—Pennsylvania, among other things, will be represented at the Paris Exposition by a lump of anthracite coal weighing six tons. Montana sends a bar of gold worth about $100,000.

—A bullion "brick" valued at $12,065 was produced from the Imperial mine, at Gold Hill, (Cal.). This is said to be the largest brick ever made in the State.

—The experiment of burning peat on the locomotives of the Great Western Railway Company was commenced recently on the Toronto branch. The article is procured from Montreal, where it is prepared for use.

The Process of Roasting Ores.

Translated from the German of F. Plattner, for the MINING & PETROLEUM STANDARD AND AM. GAS-LIGHT JOURNAL, by

J. H. TIEMANN.

[Entered according to an Act of Congress, in the year 1866, by Bryant, Callender & Co., in the Clerks Office of the District Court of the United States, for the Southern District of New-York.]

NUMBER XVI.

All that has been said relates to roasting when there is no lack of atmospheric air. If there is not a sufficient draught of air, less sulphuric acid is formed than is necessary for the conversion of all the protoxyd of iron into sesquioxyd, a large quantity of magnetic oxyd is consequently formed, and the roasting not only progresses slowly, but the required oxidation is not completed, because it is with great difficulty that magnetic oxyd is converted into sesquioxyd by the oxygen of the air alone. When sulphurets evolve much heat themselves in roasting, the operation is more quickly accomplished, without requiring much attention in muffel-shaped furnaces, or in furnaces constructed for burning gaseous fuel, where the gases as far as possible are ignited before entering the roasting chamber.

If the sulphide of iron is argentiferous the silver is changed to a sulphate by careful roasting, but if the roasting is so conducted that much magnetic oxyd is formed, which decomposes the sulphate of silver, the loss is increased without the temperature being necessarily too high.

In most cases it is not necessary to roast the ore or mill products till all the metals have been converted into free oxides; but the case is different when the ores contain gold, which is to be changed to a perchloride after roasting, by treatment with chlorine. In such a case the roasting must be conducted with all possible care, using at first a moderate, and afterwards a high heat; the draught must not be too strong, to avoid any mechanical loss; further, no particles of undecomposed sulphurets must remain after roasting, but all the particles of iron, even those which have broken off from the stamp heads, must be so highly oxidized as not to be affected by the action of the chlorine, nor must any soluble salts be present.

If the pyrities contain other sulphurets which are to be concentrated by smelting to a matte, such as sulphurets of silver, copper, nickel, etc., the roasting (when the sulphurets are in the state of washed ore, and the roasting is carried on in a reverberatory furnace) must not be carried so far that the sulphide of iron is completely changed to a free oxyd, but only so far that the quantity of sulphua necessary for the formation of the matte remains. As, however, both the bisulphide and magnetic pyrites are inclined to change almost entirely to free sesquioxyd when the air is freely admitted, even at a dark red heat, it is self evident that in order to accomplish the object, the roasting must be carried on in a different manner than if a dead roasting were required, unless the difficulty can be overcome by the addition of unroasted pyrites. As soon as the pyrites has begun to oxidize the fire in the roast, as well as the draught of air must be lessened, then by careful stirring, and with the air which is still admitted it is completely within ones power to carry out the roasting as desired. In this manner a product is obtained consisting of free sesquioxyd, magnetic oxyd, proto and persulphate and undecomposed sulphide of iron, and which contains the other sulphides either undecomposed or but partially oxidized.

Disulphide of copper Cu^2 S. When pulverized and heated nearly to a glow and constantly stirred, changes at first to suboxyd of copper and sulphurous acid; the latter changes partly to sulphuric by contact at the cost of the incoming air, and in conjunction with the oxygen of the air it acts on the suboxyd of copper, as also perhaps on the still undecomposed disulphide, changing the suboxyd in part to sulphate, and is itself again partially decomposed to sulphurous acid. The sulphurous acid set free in this manner either passes off as such, being driven off by newly formed sulphurous acid, or it again changes by contact to sulphuric acid. The formation of these products continues as long as there is any appreciable quantity of undecomposed disulphide remaining; when this has so far decreased that all the sulphurous acid set free is converted into sulphuric, and assists in oxidizing the ore, a large portion of the suboxyd changes to free protoxyd and sulphate. As long as any quantity of sulphurous acid continues to be formed, all the suboxyd cannot change to protoxyd, for the sulphurous acid changes to sulphuric at the expense of the protoxyd, and for this reason from 20 to 30 per cent. of suboxyd is found in the product, with free protoxyd and sulphate. The sulphate formed during the roasting is only changed to free protoxyd at a high temperature, because protoxyd of copper is a strong base, the sulphuric acid then goes off partly as such, and partly as sulphurous acid and oxygen. As there is a considerable quantity of suboxyd present during this time, it is converted into protoxyd by the escaping sulphuric acid, in conjunction with the exygen of the air. That portion of sulphuric acip which escapes undecomposed, absorbs moisture from the air and the gaseous products of the fuel, forming a visible white vapor. If the heat is gradually increased in such a roasting, but so that the ore does not sinter, it may be assumed with certainty that there is very little disulphide of copper left undecomposed. If on the contrary a strong heat is applied at the commencement of the operation, or if the ore is not sufficiently stirred it sinters, as disulphide of copper is readily fusible, and lumps are formed which enclose undecomposed disulphide and suboxyd. (This is easily proven by treating the lumps with sulphuric acid diluted with ten parts of water, which dissolves the protoxyd, but does not effect the disulphide or suboxyd.) Another necessary condition for changing disulphide of copper into free protoxyd is, that when the roasting is carried on in a furnace where the gaseous products of combustion pass directly from the fire-box into the roasting chamber, they must, as far as possible, be free from reducing gases or carbonaceous particles, otherwise a part of the protoxyd is again easily reduced to suboxyd.

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Fire-Damp in Mines.

M. de Fonvielle devotes an article in the *Cosmos* to the various methods hitherto devised for averting the danger arising from fire-damp in mines. After mentioning Lord Kinnaird's suggestion of a mechanical apparatus for warning off the miners when the presence of the insidious gas has been ascertained, the author of the article proceeds to notice Mr. Graham's important discovery, viz.: that diaphragms of animal matter, such as bladders, possess the property of absorbing by endosmosis, a portion of the carburetted hydrogen contained in the air.

The discovery affords a very valuable means of ascertaining the existence of fire-damp at different points of a mine; a bladder filled with common air and hung up in the suspected place will expand by the absorption of the carburet; and the amount of expansion may be ascertained by an ingenious contrivance of Mr. Aurell's, consisting in a lever which, on receiving the pressure of the swelling bladder, sets in motion an electrical ball, which gives the alarm. The miners may thus leave the mine in time, and not return to it till it is well ventilated. Experienced miners, on the contrary, affirm that they become aware of the approach of fire-damp without the assistance of any apparatus, by the mere appearance of the flame in the safety lamp; and they believe that with proper precautions they might use the common open lamp, in their opinion the best indicator of the existence of fire-damp. Perhaps it is; but then let those experienced miners explain how it happens that explosions are so frequent? The open lamp has been repeatedly tested by the imprudence of miners themselves, who, unable to bear the torture of a dim light in a dark place, have but too often occasioned catastrophes by opening their lamps. M. de Fonvielle concludes with recommending the use of Ruhmkorff's apparatus of induction for the illumination of the galleries, by which means all danger of an explosion might be altogether avoided.—*United States Medical Journal.*

Correspondence.

RIO DE JANEIRO, BRAZIL, March 11, 1867.

EDITORS GAS-LIGHT JOURNAL:

Gentlemen: I wrote you some time since that I could collect some valuable statistics concerning gas works in South America; also, I might be able to procure you some subscribers.

The first works of any importance commencing in the northern part of Brazil are at Para, on the Para River, one of the mouths of the Amazon; it is eighty miles from the ocean. On my arrival at Para I called on Mr. A. F. Wilson, Superintendent of the Gas Works, who kindly invited me to examine the works. I was much pleased at the cleanliness and order which I saw. Under Mr. Wilson's management these works must continue to improve. I am indebted to him for the following information, viz.:

The capital stock of the company is £100,000 sterling.

The number of shares are 10,000; dividend £6 per cent. interim.

The number of shares are quoted in London at par, or a little above.

They use Newcastle and Cannel coal, which cost, delivered at Para works 45s. and 58s. per ton; each ton of coal mixed yields 9,500 cubic feet. The standard candle power of which is 15 candles.

The pressure is 3-10th in day time and 10-10th at night.

The charge to customers is 8 milries, equal to $4 gold, per 1000 cubic feet.

They supply 1,016 city lamps.

The works can turn out in 24 hours 250,000 cubic feet of gas.

They have sixty-three retorts.

The capacity of gas-holder is 160,000 cubic feet.

The average loss from leakage, condensation, etc., is 8 per cent.

They have 16 miles of pipe already laid down.

They have 700 private consumers, the number increasing as fast as they can fit up.

The average consumption all the year round is 90,000 cubic feet in 24 hours.

The works were begun in May, 1864.

The officers are—President, Sir Wm. Clay, Bar't, London; Secretary, A. C. Blunt, Esq., London; Agent and Engineer, A. F. Wilson, Para; Assistant Agent and Manager, R. Hunter, Para; Engineer, Alfred Kingdom, Para.

Mr. Wilson desires to subscribe to the journal, and will forward the subscription price on receipt of the first number. I will send you a description of the other works as fast as I can get them; all I ask for my trouble is a file of your valuable journal. Yours truly,

J. H. MACKAY.

Chixa do Correio, No. 238.

N.B.—These works supply fixtures and rent them to consumers, which is a good plan, thereby increasing the number of consumers.

EFFECTS OF OIL IN A STEAM BOILER—SINGULAR PHENOMENA.—In employing for the supply of locomotives water obtained from certain collieries in Belgium, and especially those of Gilly and Charleroi, a singular phenomena is observed as soon as the pressure of the steam attains six or seven atmospheres. The water mixes with the steam and escapes in the form of mist by the discharge-pipes; the feed-pumps become insufficient, and after a journey of some miles it sometimes becomes necessary to draw the fires. This effect is attributed to the presence of a matter which, under the influence of a temperature corresponding to five or six atmospheres, causes the liquid to rise. This matter arises, in the opinion of M. Stoclet, engineer, from coal dust held in suspension in the water, which dust comprises a certain proportion of oil. M. Stoclet sees no remedy but a careful system of filtration.—*Mining and Scientific Press.*

—A party of American travellers left Cairo January 3d, for a voyage up the Nile to Upper Egypt. They sailed under the United States flag in fine large boats, the voyage to continue for several weeks.

PATENT CLAIMS.

Pertaining to Gas, Mining, Petroleum, Water etc.

FOR THE TWO WEEKS ENDING MAY 2,1867.

63,784—MACHINE FOR MAKING DRAIN WATER PIPES.—Chas. Collier, Charlestown, Mass.

I claim a clay cylinder or receiver, B, in combination with a hydraulic cylinder, operating a piston or plunger, D, for ejecting the clay from the receiver in the required form for a pipe or tile, substantially as described.

I also claim connecting the head or plunger D, with the piston, E, of the hydraulic apparatus by means of a screw, e, so that it may be moved toward and from the clay cylinder by hand for the purpose specified.

63,802—GAS BURNER.—R. B. Locke, New Orleans, La. and Wm. B. Ulrich, Concordia Parish, La.

First, I claim providing a gas burner with a small secondary gas taper or burner, which is so arranged as to serve as a means for lighting the gas when admitted to the principle burner, substantially as described.

Second. In combination with a gas burner, which is provided with a smaller gas burner or taper for lighting it, we claim a cock, D, which is constructed so that it shall cut off the gas from the smaller burner when gas is admitted to the main burner, substantially as described.

Third, The divisional piece, d, or its equivalent, applied to the orifice, a, of the grooved cock, D, and constructed with gas escapes, e e, in combination with a self-lighting burner, substantially as described.

Fourth, The hood or shell, G, in combination with a self-lighting burner which is constructed substantially as described.

63,815—GAS COOKING STOVE.—George O. Sanderson Boston, Mass.

First, I claim the combination and arrangement of the pipes, G G, with the oven, L, substantially as described and for the purpose set forth.

Second, The combination of the basins, B B', with the pot holes of the cooking stoves, substantially as described and for the purpose set forth.

Third, The combination of the short cylinders D D, with the rear pot holes and the top of the oven, substantially as described and for the purpose set forth.

63,881—HYDRO-CARBON BURNER.—Alva J. Griffin, Lowell, Mass.

I claim First, Constructing the chambers, D E, with longitudinal ribs, B C, and lateral ribs, b b b b perforated with orifices, substantially in the manner and for the purpose set forth.

Second, The gas chamber or retort, F, when combined with the chambers, D and E, substantially in the manner and for the purpose set forth.

Third, The coil pipe, J, or its equivalent, when arranged in combination with the gas retort, F, and chambers D and E, as and for the puepose set forth.

63,923—STEAM GENERATOR.—Joseph A. Miller. New York City.

I claim the combination of the water base, B2, grate A2, steam generating tubes, C2, and jacket, g2, to the fire box roof, E2, cylinder or upper chamber, G2, and return water pipes, D2, and smoke tubes, I2, the whole being arranged relatively to each other substantially as specified.

63,963—APPARATUS FOR TREATING PETROLEUM.—Alexis Thirault, Williamsburg, N. Y., assignor to himself and B. S. Hilton, New York City. Antedated April 5, 1867.

First, I claim the arrangement of one or more steam jets a, in combination with the condensing coil, A, constructed and operating substantially as and for the purpose set forth.

Second, The steam jets, d', applied in combination with tanks, C, or C', and with the pipes carrying the oil into said tanks substantially as and for the purpose set forth.

The jets d* or d'* in combination with the tanks, C or C', constructed and operating substantially as and for the purpose set forth.

Fourth, The combination of the coil, A, tanks, C C' C*, steam jets, a d d* d' d'* and coils, k i, all constructed and operating substantially as and for the purpose described.

RE-ISSUES.

2,556—METHOD OF OPERATING RAILROAD PUMPS.—Samuel Moss, San Francisco Cal., assignee of Gilbert Cole. Patented Dec. 16, 1862.

First, I claim conducting, by means of connecting pipes, the steam generated in the locomotive boiler to a stationary engine by the roadside, to operate the same as and for the purpose set forth.

Second, The combination of a stationary engine and pump, the connecting pipes, c c', and a locomotive boiler, as and for the purpose described.

2,571—MANUFACTURE OF CAUSTIC ALKALIES.—George Thompson, East Tarentum, Pa. Patented Oct. 21, 1856.

I claim the caustic alkali encased or environed in a tight integument or metallic casing, substantially as described.

J. S. PHILLIPS, C. E. M.,

MINING ENGINEER, Etc.,

from Cornwall, who came to work Ledges for a New York Company at Humboldt, Nevada, is free for Examination or Superintendence of Mines, in consequence of his immediate condemnation and abandonment of those operations.

REFERENCES:—Messrs. Daniels, Crozier, Coe, & Co., Bankers, etc., 22 Nassau street, New York. Orders by Telegram, Humboldt City, Nevada. n74-3t

Gas Engineer's Book of Reference,

Illustrated with numerous engravings, and containing description and prices of all articles required in connection with the system of Gas Illumination, as manufactured and supplied. By GEO. BOWER. 4to. paper, $1.00.

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showing the Principles and Practice of Lighting with Coal Gas, with details of Fittings. Paper, 40 cents.

GAS CONSUMER'S GUIDE.

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And so on at intervals of twenty days leaving on the Saturday previous, when a regular sailing day comes on Sunday.

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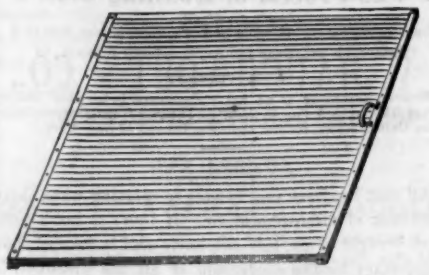

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PROPOSALS FOR THE CONSTRUCTION OF THE SUMMIT DIVISION OF THE ILLINOIS AND MICHIGAN CANAL.

OFFICE OF THE BOARD OF PUBLIC WORKS,
CHICAGO, March 18th, 1867.

Sealed Proposals will be received by the Board of Public Works at their office, until 11 A. M. Wednesday, May 1st, 1867, for the excavation necessary to deepen the Illinois and Michigan Canal, according to the plan adopted, from Chicago River to Summit Lock, No. (2) two, a distance of twenty-six (26) miles.

Maps, profiles, specifications, etc., will be exhibited at the office of the Board of Public Works in Chicago, on and after April 15th until the day of letting.

There will be some two millions (2,000,000) cubic yards of earth excavation—some of it quite hard and embracing considerable detached rock—and about four hundred seventy thousand (470,000) cubic yards of stratified limestone.

The work must be prosecuted so as not to interfere with the use of the Canal during the season of navigation.

It is believed, however, that the most of the excavation, except the stratified rock, can be done with steam dredges without interfering with the navigation of the Canal, but the rock excavation will all have to be done between the close of navigation in the fall and the opening in the spring.

If a new line be adopted for any portion of the distance, operations thereon may be continued the whole year; and the navigation of the Canal will be suspended at least five months in each year, unless otherwise mutually agreed by the Board and Contractors.

The whole of the work must be done on or before the end of the third season of the suspension of navigation.

A large amount of machinery will be required to excavate the work within the time required, consisting mainly of steam dredges, scows and cranes for the earth work, and drilling machines, pumping machinery and cranes for the rock.

Contractors will be required to commence work on the earth excavation within thirty days of the time of letting, and upon rock excavation by the 1st of November next.

The dredges, cranes and scows now in the Canal can be had at an appraised value, which will be made known to bidders prior to the letting.

Parties contracting for the work will be required to provide all machinery, and to put up and remove all dams and all works of protection, and at their own expense to do all pumping, or whatever may be necessary to secure their work from water.

Proposals must be addressed to the Board of Public Works, endorsed "Proposals for Deepening Illinois and Michigan Canal," and be accompanied with the usual two hundred dollar ($200) bond, with sureties, to be approved by the Board.

Contractors will bid, stating the price for which the work will be done on each of the different sections, and the work will be let as a whole or in part, and in such quantities as the Board shall determine.

The Board reserve the right to reject any and all bids, and no proposal will be accepted unless the party offering it shall give evidence satisfactory to the Board that he has the necessary skill, experience, energy and ability for doing the work, is trustworthy, and has sufficient pecuniary resources.

The Board will require such security as, according to their judgment, will secure the doing of the work according to the contract.

J. G. GINDELE,
FRED. LETZ,
O. J. ROSE,
WILLIAM GOODING,
R. M. MASON,
75-3t Board of Public Works.

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Malleable Iron Retort Lid.

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Furnace Door and Frame.

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Gas Stoves made by us are constructed under the immediate supervision of A. L. Bogart, Esq., Analytical Chemist and Gas Engineer. They contain recent improvements of a scientific character—by means of which a PERFECT COMBUSTION is obtained, and the Caloric produced, rendered CHEMICALLY PURE. Too much cannot be said against the use of Gas Stoves for heating apartments—when the products of combustion (Carbonic and Sulphurous Acids are emitted without purification into the atmosphere. Your Physicians will inform you, that this is a subject of vital importance) and worthy of your closest scrutiny—before purchasing. The public are invited to examine into the merits of these inventions.

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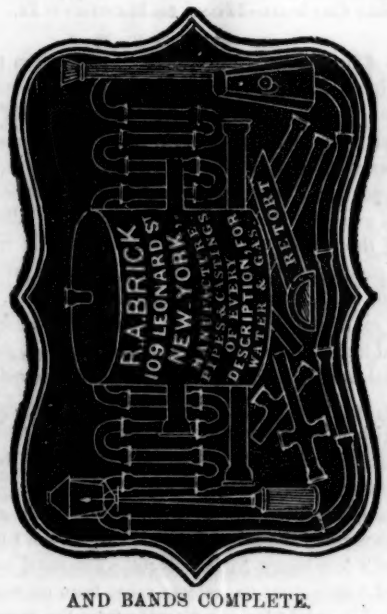

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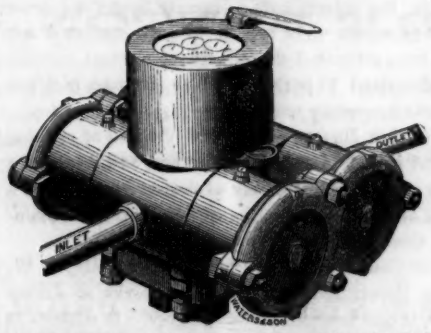

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This Meter is also used for the measurement of Oil —it combines

ACCURACY, SIMPLICITY, and REMARKABLE DURABILITY with such ease and certainty of motion, as to offer no appreciable obstructions to the flow of water in the pipes to which it is connected, as it runs and registers upon three inches head, or when delivering the smallest stream. These qualities, with its low cost, have caused its extensive adoption by corporations and individuals, in many of our largest cities.

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WILCOX & GIBBS' SEWING MACHINE.

It is entirely noiseless. A patented device prevents it being turned backward. The needle cannot be set wrong. It received the gold medal of the American Institute in 1863. Send for a circular containing full information, notices from the press, testimonials from those using the machine, &c.

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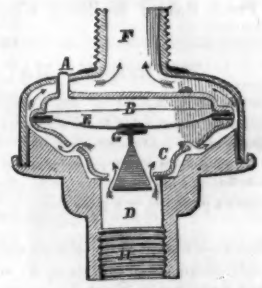
NOTICE

To Gas Companies and Gas Consumers.

THOMPSON'S GAS CONTROLLER.



The only perfect SELF-ACTING REGULATOR and burner combined ever invented or known to science.

This Automatic Gas Controller works upon a simple and well-known principle n Mechanics. The lower cut fully shows its construction. The conical valve at G is attached to the elastic diaphragm, E. As the gas enters in the direction as shown by the arrows, the diaphragm E is acted upon according to the pressure of the gas, and tends to close the valve upon its seat. The chamber, B, of the inner case communicates with the air by the orifice, (A). Hence the gas below the diaphragm is only balanced by the air above it and the valve falls or rises as the pressure varies, to regulate the admission of the gas, and consequently the pressure at the burner.

This Controller will save from 25 to 60 per cent.of gas according to the pressure in the mains, and gives a beautiful, steady light, at a minimum of cost.

Late improvements have made this Controller simple, durable and an unrivalled gas economizer.

Reference is permitted to the following gentlemen :—

Col. Chas. Roome	Pres't	Manhattan Gas Co., N. Y.
C. H. Sand, Esq,	"	Metropolitan Gas Co., "
J. H. Adam, Esq..	"	New York Gas Co., "
Peter Cooper, Esq,	Cooper Institute,	"
John A. Duff, Esq.,	Olympic Theater,	"
Geo. H. Kitchen,	Inspector of Gas Meters,	"
A. L. Bogart, Esq.,	Gas Engineer,	"
Col. J. A. Sabbaton,	Engineer Man. Gas Co.,	"
Col. A. J. White,	" Met. Gas Co.,	"
J. K. Simpson,	" Cooper Institute.	"

Persons interested are invited to call at the office, 22 Pine-str't where they can see the operation by pressure guage and test meters.

M. L. CALLENDER, Agent.
22 Pine Street.

J. H. TIEMANN.

ANALYTICAL CHEMIST,

Metallurgist & Mining Engineer.

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AND

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Capital Stock $300,000,

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Office of the Company, 30 Pine street, New York.

☞ The mine of this company rapidly approaching that point of development which will necessitate the erection of a Mill, the Trustees are authorized to dispose of 10,000 shares of the reserve capital stock.

Mining & Petroleum Standard

AND

AMERICAN GAS-LIGHT JOURNAL,

Published on the 2d and 16th of Each Month

At No. 22 Pine Street, New York.

BRYANT, CALLENDER & CO.,

EDITORS AND PROPRIETORS.

Profs. PARTZ & BUCK, Consulting Chemists.

THURSDAY, MAY 2, 1867.

WISHING TO MAKE this Journal an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of those subjects a pleasure, or a profession.

SUBSCRIBERS would confer a favor upon us by remitting CHECKS or POST OFFICE MONEY ORDERS, as we are frequent losers where money is enclosed in letters.

☞ NEWS AGENCY.—The American News Company, 119 and 121 Nassau street, New York, are agents for this Journal. Newsdealers will please send orders to them.

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Answers to Correspondents.

"S. C." of Cal.—No explosion can take place in a boiler from carbonized oil, by the gas mingling with the oxygen of the water, as you assume, because there is no free oxygen in the boiler. Oils and other foreign substances may produce priming in your boilers, but there is no explosive properties produced on that account. You can supply the loss of water in the boiler which is converted into steam, only by forcing more water into the boiler against the pressure of the steam—as by the feed-pump, for instance, or its equivalent.

"O. R." of Ill.—To mix oil with water, dissolve about 1 ounce of potash in a pint of water; then add about half a gill of olive oil, and stir briskly, when they will combine and become whitish and opaque. These proportions will answer for any other quantity. Many lubricating oils are made upon this principle.

"A. B." of N. Y.—The resistance to the flow of water in pipes is caused by friction, and increases in proportion to the length of the pipe, other things being equal. The action of the water ram is owing to the impulse given to a small column of water to elevate it to a greater height by the momentum imparted to it by a large column or body of water in motion at a low head or pressure. Of course, at a given head the power of the impelling column of water will be the same, excepting the difference in friction between a long and short pipe at different angles.

"N. S. A." of Mass.—Pure Knolin clay, dried, and reduced to powder and mixed with boiled linseed oil makes a good and cheap cement for curbstones, tombstones and the like when exposed to the weather.

"S. P." N. Y.—To make a cheap filter for water, take a stout barrel with one head and bore it full of small holes; lay upon this batton a thick piece of clean fel or flannel, and pour in fine sand to the depth of four or five inches; fill with freshly burned charcoal to the depth of a foot or more, cover this with a clean flannel upon which place a quantity of clean pebbles and coarse gravel and your filter is ready for use. The sand and charcoal will require to be renewed occasionally.

"Various Correspondents."—The "American Gas Improvement Co.," who advertise in the *Tribune* and elsewhere so extensively, are introducing, simply, apparatus to carbonize the ordinary coal gas. That is to pass the gas into a chamber containing a hydro-carbon, with a view to have the gas take up its vapor to increase its brilliancy. Its merits and demerits (and it has both) are subjects for discussion.

Gas Carbon--How to Remove It.

The difficulties which all gas men encounter in the deposition of carbon upon the inside of the retorts is familiar to every gas engineer. It accumulates to such an extent after a time as to materially decrease the capacity of the retorts, sometimes to the extent of 30 per cent., and in extreme cases 45 per cent. A still greater evil is experienced besides the filling up of the retorts. The gas-carbon deposited is a hard, compact material of semi-metallic lustre when broken, and a powerful non-conductor of heat, so much so that at last when the carbon has become several inches thick the loss in heat is so great that the coal can be distilled only with the greatest difficulty, requiring the charges to remain in much longer, with an increase of heat in the furnaces, and a corresponding increase in the consumption of fuel reaching frequently 25 per cent.

It has long been a great desideratum with gas men to remove the gas-carbon with less loss of time and with less injury to the retorts. The usual method of burning out the retorts takes from twenty-four to forty-eight hours, and aside from the cost of fuel and the loss of time to accomplish the desired result, the retorts suffer severely from the intense heat to which they are necessarily subjected. It has been estimated that the life of a retort is thereby shortened 25 per cent. on an average, and iron retorts frequently much more.

THE AIR DRAFT.—The usual method of opening a vent in the plate or mouth-piece, and inserting a tube extending to the rear of the retorts to admit a draft of air to consume the carbon thereby, is plainly a slow and tiresome process.

THE COMBINED STEAM AND AIR BLAST.—Mr. G. W. Edge, Superintendent of the gas works at Jersey City, is the inventor of this process. It consists in introducing midway into the air tube used in the old process a small steam pipe. The jet of steam enters the larger outer tube with force, and draws in and mixes with the air and projects it with great force upon the incandescent carbon, which rapidly yields to its action, being consumed or converted into carbonic acid, and perhaps a little free hydrogen, by the combined action of the air and steam. This is being largely introduced and gives excellent satisfaction.

METROPOLITAN AIR BLAST.—We understand the efficient engineer, Mr. Sabbaton, of the Manhattan gas works has improved the old "Air Draft" by employing an air pump or bellows to give greater force to the ingoing current of air, converting it practically into a "blast."

This no doubt will be efficatious for the purpose intended, and if the motive power can be applied readily and cheaply it will be an improvement which will meet with favor.

Mr. ——. Havens, the Superintendent of the Brooklyn gas works, has invented a modification of this plan which consists in a simple, portable apparatus for obtaining a draft or blast of air by a revolving or rotary machine which gives motion to the air upon the principle of the "rotary blower" so much used at the present day in foundries and blast furnaces and to give force to the draft under steam bollers and elsewhere.

We are of the opinion that the carbon should be removed more frequently from the interior of gas retorts than is the general practice. It will then be more easily removed and the loss of fuel by its non-conductability will be less in proportion, because as the carbon becomes thicker the conductability decreases in a greatly increased ratio.

CHEMICAL ACTION.—It is remarkable that our gas engineers do not experiment more effectually to find a way to remove the gas-carbon from retorts by means of some chemical operation. All it needs is the introduction of some material or materials which will act upon the hard incrustations to either soften it, or produce a shrinkage, whereby it would separate from the retort and be easily removed.

Chloride of sodium or common salt if placed upon red hot gas-carbon will have a measurable effect to this end. Sulphate of potash or soda used in the same manner will also change the texture and nature of the carbon, and so will the carbonate of soda and potash have a beneficial effect. Phosphate of lime moistoned with weak acid solution (sulphuric acid is the best) mixed with spent tan bark will probably give results quite satisfactory. Even oyster shells, if placed in a retort instead of the ordinary charge of coal, will cause the carbon to separate from the retort so as to be easily removed, upon the same principle that they will remove clinkers from coal stoves.

Weather Predictions.

The subjoined statement will foretell the weather in advance up to January, 1868. This statement has been calculated by a person who has been interested in this matter, and who has made the weather a study for the last twenty-five years, and founded also upon the experience of his father for forty years, and he now endeavors to lay before the public something that may be reliable:

We will begin with the lunar month, commencing March 6th to April 4th, 1867, for twenty days out of the twenty nine the wind will be northeast—expect frequent rain and snow storms. The week after the 20th of March as many pleasant as stormy days. The lunar month, commencing April 4th and ending May 4th, for twenty days out of twenty-nine the wind will be west, one hour south with frequent showers and sunshine—the week after the 18th rather stormy.

From May 6th to June 2d, for twenty days out of twenty-nine the wind will be northeast with heavy rains—the week after May 18th rather stormy.

From June 2d to July 1st, for twenty days out of twenty nine the wind will be southeast with frequent change to northeast, and the latter part of the month will change to southwest, and will have a warm week. After June 16th it will be very pleasant.

From July 1st to July 30th, for twenty days out of twenty-nine the prevailing wind will be southwest with one or two heavy thunder showers. The week after the 16th of July there will be four pleasant days.

From July 30th to August 29th, for twenty days out of twenty-nine the prevailing winds will be north, and frequently changing to southeast. The week after the 15th of August there will be as many pleasant as rainy days.

From August 29th to September 27th, for twenty days out of twenty-nine the wind will be southeast and warm, frequently changing to southwest. The week after the 13th of September will be stormy.

From September 27th to October 27th, for twenty days out of twenty-nine the wind will be southwest and pleasant. The week after the 13th of October will be rather stormy.

From October 27th to November 26th, for twenty days out of twenty-nine the wind will be southeast. The week after the 11th will be rather stormy.

From November 26th to December 25th, for twenty days out of twenty-nine the wind will be north, cold and pleasant. The week after the 18th of November will be very clear and pleasant.

From December 25th, for twenty days out of twenty-nine the wind will be southwest with pleasant weather, but the week after the 11th will be rather stormy.

This estimate will be found correct for a distance of 250 miles from New York, with an occasional variation perhaps owing to local causes.

This article was handed in over a month ago and was not published for want of space. We give the estimate of the two months nearly past, to show how correct it was. Of course our weather friend considers the estimates made by the *Herald's* weather man, of only two or three days in advance by the aid of the barometer, as quite frivolous in comparison. His method of foretelling the weather is entirely new and original with himself and his father before him, and he can with certainty lay down a table of the weather from January to December of each year. He proposes to publish the rules he employs for making his estimates, and will accept proposals from any publisher in good standing to do the work, or will sell the copyright.

Contractors for Gas Works, Etc.

We desire to call the attention of gas men to the card of Messrs. Hoy, Kennedy & Co., in the adjoining column. These gentlemen are well and favorably known to the public already, for enterprise, energy and intelligence, and especially in the line of business in which they are engaged, have they made their mark. Mr. Jno. P. Kennedy has contracted for, and built some of the most prominent gas works in the country. The Metropolitan gas works of this city were erected by him, so were the gas works of San Francisco.

Parties desirous to have works built upon the most approved and economical plans will do well to give them a call at their rooms, No. 111 Liberty street, where they have offices and large show-rooms' devoted to the display of the latest and most popular improvements in railroad engineering and supplies, and samples of the various gas apparatus of modern times.

New Advertisements—The Journal as an Advertising Medium.

Gas men will please observe the advertisement of the Newburgh Gas-light Co., of apparatus for sale; also that of the Gas-Meter Company, limited, of London, Dubiin and Oldham, of models, etc., to be exhibited for the first time at the Paris Universal Exhibition. We also refer our readers to the sale of valuable lead mining property at auction, May 8th, at 12 o'clock, by John H. Draper & Co., 111 Broadway.

In this connexion we will mention that this is the only Journal devoted to gas matters in the United States, and is read by nearly all gas men of intelligence and enterprise. Hence may be inferred its value as an advertising medium for all matters appertaining to Gas and Light, Heat, etc. And the other specialities upon which it treats and its general scientific character will commend it, as an advertising medium, to all who desire to reach special classes or the public at large, in any way interested in scientific matters and the general improvements of the day in mechanics, arts, manufactures, and the like.

☞ Foreign Letters and Subscriptions.—Our readers will be interested, doubtless, in the perusal of the letter under the head of "Correspondence," dated at Rio de Janeiro, S. A. Our Journal, it will be observed, is being sought after and appreciated outside of the United States, and as an instance we may mention that within a few days we have received subscribers from Australia, England, France, and Austria. We hope to hear often from our correspondent in Rio de Janeiro often.

American Portable Gas Company.

The excellent engravings on the first page of this number of the Journal, clearly illustrates the very best apparatus we have seen for converting atmospheric air into a cheap and convenient illuminating gas. Its chief characteristics are simplicity and safety of the apparatus, and the purity and steadiness of the light it affords.

The Carburator is detachable from the air machine, and has been newly improved, and is applicable for increasing the luminosity of ordinary coal gas.

Messrs. Monroe & Smith are general agents for these improvements, and are putting them up all over the country. The Company's office is at 31 Courtland street, N. Y.

Leavitt's Peat Journal.—Is a monthly paper devoted especially to the dissemination of information relating to the production of fuel from peat, and generally to all that pertains to the economical production and use of fuel of all kinds.

Messrs. Leavitt & Hunnewell, 49 Congress-street, Boston, are the publishers.

These gentlemen have been really the active, practical pioneers in popularizing peat as a material for fuel. Probably no other persons in this country have done more than they toward developing the art of preparing peat for fuel, and the various purposes to which it is applicable.

The apparatus and machinery for excavating grinding, pressing and drying the peaty material which these gentlemen have invented and put into practical operation, seems to meet with general favor with those who have the enterprise to make money out of their swamps, by converting them into cheap fuel, gas material and fertilizers.

We heartily commend the *Peat Journal* and its enterprising publishers to all who are interested in the subjects to which it is devoted.

☞ Ashcroft's Portable Water Detector.—We have fully expressed our opinion of this most valuable invention upon our last page, where the engraving and description of the apparatus will be found also.

PARIS UNIVERSAL EXHIBITION, **1867.**

BRITISH SECTION, CLASS 53.

The GAS-METER COMPANY, Limited,

Of LONDON, DUBLIN and OLDHAM,

Exhibit in the above Class,

Models of Station-Meter and Governor, a Test Gasholder, Wet and Dry Gas-Meters and Liquid Meters;

Principally in Glass, working daily.

Friends and Patrons will find the above well worth a careful examination, as none of the articles have been exhibited before, the whole having been designed and manufactured specially for the above Exhibition.

GEORGE RAIT, Managing Director,
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B. BRADSHAW,
Representative of the Gas-Meter Company
at the Exhibition Building, or at the
77-78 Hotel Buckingham, Rue Pasquier, Paris.

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A COMPLETE SET OF HOISTING APPARATUS for working four Purifying Boxes from 4 to 7 feet diameter, consisting of Shaft and Screw, Pulley and Spokes, to every two Boxes, nearly new. Offered at a low price on account of being too small for the Works. Apply to or address

NEWBURGH GAS-LIGHT CO.,
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J. H. DRAPER, Auctioneer.

Valuable Lead Mining Property at Public Auction.

JOHN H. DRAPER & Co.

Will sell on WEDNESDAY, May 8th, 1867, at 12 o'clock, Noon, at the Exchange Salesroom, 111 Broadway,

All the right, title and interest in certain seven leases for mining privileges, dated in 1863, and running fifty years from that time, covering 380 acres more or less, situated at Martinsburg, Lewis County, New York. Also therewith, Smelting House, Engine, Boiler, Machinery, Tools, Supplies, and Twelve other Buildings, large and small, complete for immediate operation.

Catalogue with extensive details can be had at the office of the Auctioneers, 112 Pearl street, New York. 177

JAMES HOY. JNO. P. KENNEDY. WM. E. HOY.

HOY, KENNEDY & CO.,

Engineers and Contractors

FOR THE ERECTION OF

GAS WORKS,

Extensions, and Improvements, are prepared to supply

GAS-LIGHT COMPANIES

With all the materials used by them. [77-tf

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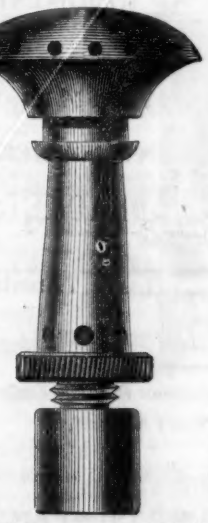
JONES & COLLINS'

AERO GAS HEATER BURNER.

Patented 7th August, 1866.



The utility of the article will be at once apparent. It is used chiefly for Glue Kettles, Hot Water Boilers, Oyster Saloons, the Sick Chamber, or Nursery; for Jewelers, Artists, and Photographers. Its perfect combustion, freedom from soot or smoke, great economy of Gas, and its adaptation to different pressures by its regulating screw, make it a desirable article.

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In all Wire Gauze and Perforated Heaters, it is necessary to keep a nearly wide open cock, and consequently large consumption of Gas. This burner can be turned down so as to use not more than 1-5th of a foot per hour.

DIRECTIONS FOR USE.

Screw on the Burner as it comes in the package. Light the holes in the dome top. Then, by gradually unscrewing the cylinder from the base, it (the cylinder) is elevated, and the air passages opened, permitting the air to mix with the Gas until the flame becomes quite blue, and combustion perfect.

Burners 2 feet per hour.
" 4 feet per hour.
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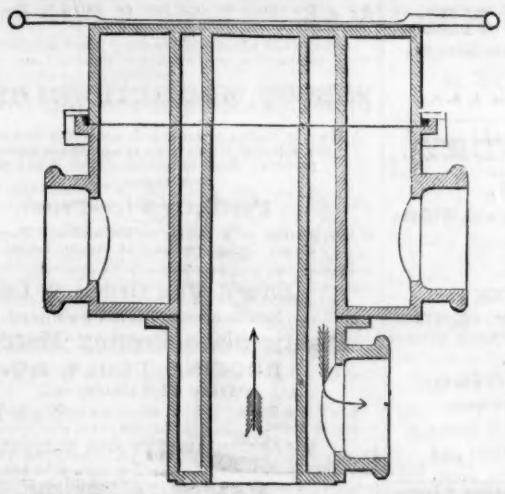

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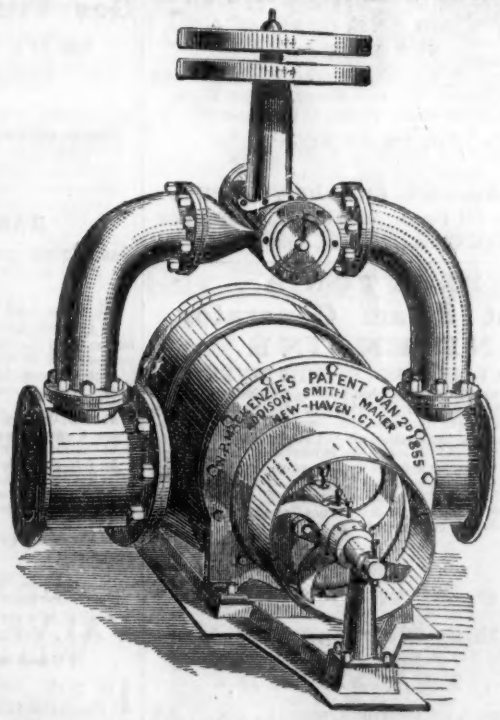

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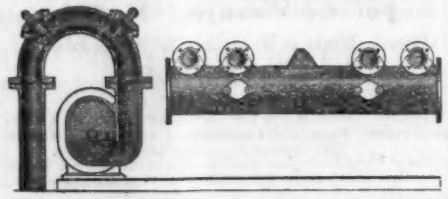

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DEALER IN

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SUITABLE FOR GAS MACHINES, ALSO FOR CARBURETTING OF GAS, &c.

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THE VALUABLE IMPROVEMENT FOR SAVING and otherwise improving the gas, invented by Dr. J. S. Wood, described in the "Gas-light Journal" October 2d, 1866, is now for sale by State or County rights.

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STEVENSON'S

Helical Jonval Turbine Water Wheel,

For first-class mills and factories where great economy of wate and simplicity and durability are required.

Manufactured by the Patentee,

J. E. STEVENSON, Hydraulic Engineer,

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☞ Stevenson's Jonval Turbine Water Wheel gave the highest per centage of power over all others at the trial of Water Wheels at Fairmount Works, Philadelphia, March 9th, 1860. NINETEEN WHEELS WERE TESTED. The only practical test on record.

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With STEARN'S PATENT SETS, far superior to Rack and Pinion and Screw sets. Years of wear will not cause lost motion. All plank sawed with perfectly even thickness. No time lost in setting. Suitable for sawing any kind of Lumber and Timber.

SUPERIOR MULAY MILLS

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Especially adapted to lumbering purposes.

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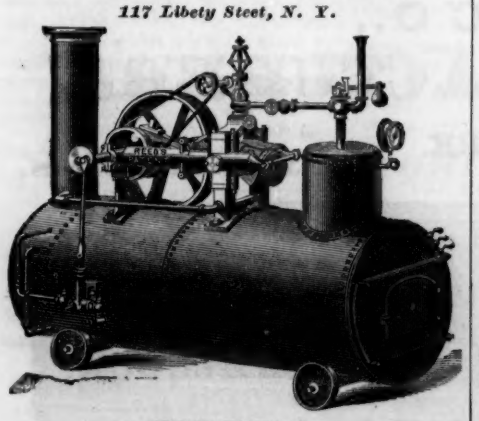

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ENGINES,

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Kerosene Cooking & Heating

STOVES AND RANGES.

THESE COOKING STOVES WILL

☞ *Bake, Boil, Stew, Fry and Roast,*

With the greatest economy and facility, and without heating the room in which they are used. They are perfectly simple, operating like an ordinary Kerosene Lamp with a chimney, and are the only Kerosene Stoves that burn without smoke or odor.

"We have been perfectly astonished to see what a labor-saving, dirt saving and heat-saving institution is EDDY'S PATENT KEROSENE STOVE. Taking the cost of running it, and the result attained, it is the best patent in the market."—*Worcester Daily Spy.*

Our Heating and Cooking Stoves are very convenient and economical, especially where a fire is required but a few hours at a time.

Orders for Stoves may be sent through American Advertising Agency, 389 Broadway, New York.

ALEX. M LESLEY,

Manufacturers, No. 605 Sixth Ave., New York.

Send for Illustrated Circular. (136

KNITTING MACHINES

FOR

Families and Manufacturer,

☞ *Something New and Invaluable for Family Use.*

We offer the public the simplest, strongest and best Knitting Machine in the world.

It occupies but little space—is portable and can be attached to a stand or table, weighs about 40 lbs.

It will knit a variety of Stitches—the breakage of needles is trifling—the cost of needles is insignificant and the most delicate material can be knit pure and spotless, as the needles are not oiled.

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Send for a Circular—Agents wanted.

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WEED'S

HIGHEST PREMIUM

Shuttle Sewing Machine

Has only to be seen and operated to be Appreciated.

Call and see for yourself before purchasing. Please bring samples of various kinds of thread, (such as is usually found at stores,) and various kinds of fabric, which you know the former most popular Sewing Machines either cannot work at all, or, at best very imperfectly.

SUPERIORITY.

over any other Machine in the market will be seen at a glance.

1st It runs easily and rapidly, and is so constructed as to endure all kinds of hard usage.

2d. No breaking of threads in going over seams.

3d. No imperfect action of the feed at uneven places in the work.

4th. The Weed-stitch catches of itself, and will sew from the finest lace to the heaviest leather, and 200 cotton to coarse linen thread.

5th. The Weed Machine will do beautiful quilting on the bare wadding, without using inner lining; thus leaving it soft as if done by hand.

6th. The variety of fancy work that can be done on the

WEED MACHINE,

with so little trouble, makes it equal, if not superior, to six machines combined; for instance. it Binds, Hems, Tucks and Sews on the band at the same time, and in face, the

WEED NO. 2 MACHINE,

as before stated, is equivalent to a combination of any six ordinary machines.

Orders for Machines may be sent through the American Advertising Agency. 389 Broadway, N. Y.

Below we give a few prices:

No. 2. Oil Black Walnut, Ornamented with Hemmer.	$60,00
No. 2. Oil Black Walnut, Hall Case, Ornamented, with Hemmer.	65,00
No. 3. Extra Oil-Polished Black Walnut, Half Case, Large Table beautifully Ornamented.	75,00

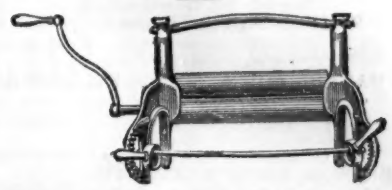
WEED SEWING MACHINE Co.,

186. 506 Broadway, New York

PUTNAM'S CLOTHES WRINGER.

IT IS THE ONLY RELIABLE

Self-Adjusting Wringer.



No Wood-work to Swell or Split. No Thumbscrews to get out of order. Warranted with or without Cog wheels.

It took the First Premium at Fifty-seven State and County Fairs in 1863, and nearly double that number in 1864, and is, without an exception, the *best* Wringer ever made. Patented in the United States, England, Canada, and Australia. Agents wanted in every town, and in all parts of the world. Energetic agents can make from $3 to $10 per day

WHAT EVERYBODY KNOWS, VIZ.:

That Iron well galvanized *will not rust.*

That a *simple* machine is better than a complicated one.

That a Wringer should be *self-adjusting, durable, and efficient.*

That thumb-screws and fastenings cause *delay* and *trouble* to regulate and keep in order.

That wood soaked in water will *swell, shrink,* and *split.*

That wood-bearings for the shaft to run in *will wear out.*

That the Putnam Wringer, with or without cog wheels, will *no tear the clothes.*

That cog-wheel regulators are not essential.

That the Putnam Wringer has *all* the advantages, and *not one* of the disadvantages above named.

That all who have tried it pronounce it the *best* Wringer ever made.

That it will wring a thread or a bed-quilt *without alteration.*

We might fill the paper with testimonials, but insert only a few to convince the skeptical, if such there be; and we say to all, *test* Putnam's Wringer. Test it *thoroughly* with *any* and any others, and if not entirely satisfactory, return it;

PUTNAM MANUFACTURING CO.—*Gentlemen:* I know from practical experience that iron well galvanized with zinc will not oxydize or rust one particle. The Putnam Wringer is as near perfect as possible, and I can cheerfully recommend it to be the best in use. Respectfully yours,

JOHN W. WHEELER, Cleveland, O.

Many years' experience in the galvanizing business enables me to indorse the above statement in *all particulars.*

JOHN C. LEFFERTS, No. 100 Beekman St.

NEW YORK, *January,* 1864.—We have tested Putnam's Clothes Wringer by practical working, and know that it will do. It is cheap; it is simple; it requires no room. whether at work or at rest; a child can operate it; it does its duty thoroughly; it saves time, and it saves wear and tear. We earnestly advise all who have *much* washing to do, with all intelligent persons who have *any,* to buy this Wringer. It will pay for itself in a year at most. HORACE GREELEY.

PRICES—$8, $9, and $10.

Sample Wringers sent, express paid, on receipt of price. Manufactured and sold, wholesale and retail, by

PUTNAM MANUF'G CO.,

13 PLATT STREET, New York,
BENNINGTON, Vt.,
CLEVELAND O.

C. GEFRORER,

MANUFACTURER OF

Gas Heating Apparatus

OF EVERY DESCRIPTION,

Gas Burners, &c.

No. 529 COMMERCE STREET,

PHILADELPHIA, PA.

Burners for Wood, Coal Oil and Water Gas.

Gas and Lava Burner Tips

Constantly on Hand.

THE AMERICAN METER CO.

Organized under the General Manufacturing Laws of the State of New York

SAMUEL DOWN, President. HENRY CARTWRIGHT, Vice President. RICHARD MERRIFIELD, Secretary and Treasurer

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SAMUEL DOWN, WILLIAM HOPPER, R. H. GRATZ, HENRY CARTWRIGHT, RICHARD MERRIFIELD.

THOMAS C. HOPPER, *Superintendent at Philadelphia.*

This Company is now prepared to furnish WET AND DRY GAS METERS, STATION METERS, GOVERNORS, PRESSURE INDICATORS AND REGISTERS, SERVICE and METER COCKS, and all other articles in their line appertaining to the use of Gas-Works.

The combination of Mechanical and Scientific Skill, and the long experience of the several members of the Company, is a sure guarantee of durability, accuracy and excellence of workmanship. Orders addressed

AMERICAN METER COMPANY,

West Twenty Second Street, New York. Arch and Twenty-Second Streets, Philadelphia. No. 23 West Street, Boston will meet with prompt attention.

Harris & Brother, Practical Gas Meter Manufacturers,

Continue, as heretofore at their old Establishment, No. 1117 CHERRY ST., PHILADELPHIA, to Manufacture

WET AND DRY GAS METERS, and all kinds of GAS APPARATUS, and furnish all articles appertaining to the use of Gas Works. ☞OUR WORK WARRANTED—Satisfaction Guaranteed. Orders respectfully solicted, and promptly attended to, by

HARRIS & BRO., No 1117 Cherry st., Philadelphia.

Messrs. Harris & Brother, Philadelphia Gas Works, February 14, 1857.

Dear Sirs;—I take great pleasure in stating that we have found your meters to register with entire correctness, and to be generally of very good quality—the number furnished by you to these works is over 5,000.

John C. Cresson, Engineer;

Office of the Gas Light Company of Augusta, Ga., March 6th, 1858.

This is to certify that having used meters manufactured by Messrs. Harris & Bro., for the last nine years, we do not hesitate to state they have given entire satisfaction in point of wokmanship and accuracy of registration; they are surpassed by none, and equaled by few manufactories in the Union; we have used meters made by other establishments but our preference is in favor of those made by Harris & Bro., of Philadelphia, Pa.

G. S. Hookey, Superintendent of the Gas Light Company of Augusta, Georgia.

Messrs. Harris & Brother, Philadelphia. Philadelphia, March 4, 1858.

Gentlemen—We take great pleasure in bearing our testimony to the very superior character of the meters we have received from your establishment. We have always found the workmanship all we could desire, while the accuracy and reliability of their measurement have always been satisfactory. We have used meters made by other parties, and none have given as entire satisfaction as those received from you. We are, gentlemen, very truly, yours, Birkinbine & Mears.

Messrs. Harris & Brother. March 14, 1857.

Gentlemen—For the last ten years we have used in the Philadelphia Gas Works, meters made in your factory, and take pleasure in expressing my opinion to their correctness. On several occasions I have taken your meters apart, and found the material used in the manufacture of the same, to be as fine quality as is used in those imported from Europe, or made by any of the manufactur in the United States. Respectfully Yours George Wiegand, Inspector of Gas Fittings, Philadelphia

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MANUFACTURER OF GAS BURNERS,

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Burners for Wood, Coal Oil, and Water Gas. Brass and Lava Burner Tips Constantly on Hand.

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THE ATTENTION of the public and the trade is invited to our New Scale, Seven Octave, Rosewood Piano-Fortes, which for volume and purity of tone are unrivalled by any that have hitherto offered in this market. They contain all the modern improvements, French Grand Action, Harp Pedal, Iron Frame, Over-strung Bass, etc., and each instrument, being made under the supervision of Mr. J. H. Grovesteen, who has had a practical experience of over thirty years in their manufacture, is fully warranted in every particular.

THE "GROVESTEEN PIANO-FORTE"

RECEIVED THE HIGHEST PREMIUM AT THE

CELEBRATED WORLD'S FAIR.

Where were exhibited instruments from the best makers of London, Paris, Germany, Philadelphia, Baltimore, Boston, and New York; and also at the American Institute for five successive years, the gold and silver medals from both of which can be seen at our warerooms.

By the introduction of improvement we make a still more perfect Piano-Forte, and by manufacturing largely, with a strictly cash system, are enabled to offer these instruments at a price which will preclude all competition.

PRICES

No. 1,	Seven Octave, round corners, Rosewood, Plain Case,		$275
No. 2,	"	" " Heavy Moulding	300
No. 3,	"	" " Louis XIV style	325

a fac-simile of the accompanying cut.

TERMS—Net Cash, in current funds Descriptive circular sent free on application.

MORRIS, TASKER & CO.,

PASCAL IRON WORKS

[ESTABLISHED 1821,]

PHILADELPHIA,

Manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues, GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

Gas and Steam Fitters' Tools, &c.

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THOMAS S. TASKER,
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MERRICK & SONS, Engineers,

MANUFACTURERS OF EVERY DESCRIPTION OF GAS MACHINERY.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either Telescopic or Single, with Suspension Frames complete; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron, Line Sieves for Purifiers, Hoisting Machines for Lifting Purifier Covers.

Address— MERRICK & SONS,
5th and Washington Sts, Philadelphia.

S. FULTON & CO.,

(Successors to Colwell & Co.)

Manufacturers of

PIG IRON & CAST IRON GAS & WATER PIPES.

Also, Heavy & Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

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TO GAS COMPANIES.

THE UNDERSIGNED DESIRES TO undertake the supervision of several small Gas-works, to visit and examine them as often as may be necessary; to obtain and inspect their coal, castings, fire-brick, and other materials; and to manage their general business in such a manner that they shall be under such supervision as is now attainable in large works, at much increased cost. Also, to advise as general Consulting Engineer and expert in practical chemistry.

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Late Asst. Engineer of the Philadelphia Gas-works
417 Walnut st., Philadelphia.

POOLE & HUNT,
BALTIMORE, MD.,
are prepared to execute orders for
GAS-HOLDERS,
IRON-ROOF FRAMING,
And other descriptions of
Iron Work for Gas-Works, Water-Pipes, and Heavy Castings, and Machinery generally.

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NEW PATENT

GAS APPARATUS

For Country Residences, Public Buildings, &c.,

FROM $300 UPWARDS.

EVERY DESCRIPTION OF GAS FIXTURES.

Gas Fitting in all its branches

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NEW YORK.

THE WOODWARD
Steam Pump Manufacturing Company,

MNUFACTURERS OF THE WOODWARD PATENT IMPROVED

SAFETY STEAM PUMP,

—Adapted for Mining and Fire Purposes—and
Steam, Water & Gas Fittings of All Kinds.

Also, Wholesale and Retail Dealers in WROUGHT IRON PIPE, BOILER TUBES, etc.,

Woodward Building, 76 and 78 Centre Street,

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Formerly 77 Beekman Street, *New York.*
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Above Ridge Avenue, Philadelphia, Pa.,

MANUFACTURER OF

Wet and Dry Gas Meters,

STATION, SHOW, & EXPERIMENTAL METERS,

Photometers, Pressure Registers, Indicators, and Gauges, Governors, Meter Provers, Centre Seals, Fluid Gauges, &c.

GAS APPARATUS

Of the most reliable and approved construction manufactured and on hand at the

UNION GAS METER WORKS.

D. PARRISH, Jr.,

GAS ENGINEER

And Contractor for Coal or Oil Gas-Works.

Estimates given for Gas-Works, Gas-Holders, or any Gas Apparatus.

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Box 1956, Post Office.

To Manufacturers of Petroleum Gas.

For sale, Parrish's Patent Gas and Air Mixer, adapted to all works using Petroleum or other oils, by which rich Petroleum Gas is mixed, after it leaves the holder, with a proper proportion of air, giving it the greatest illuminating power, without smoke, through any burners. The apparatus being attached to the outlet pipe, requires no alteration of the works.

Apply at the Gas-Works of St. Nicholas Hotel, No. 68 Mercer st., N. Y., where one can be seen in operation; or address D. Parrish, Jr., St. Nicholas Hotel, New York city, or No. 1416 Arch street, Philadelphia.

SAVING OF FUEL TO PARTIES USING STEAM.
DAMPER REGULATORS.

Guaranteed to effect a great saving in fuel and give the most perfect regularity of power. For sale by the subscribers, who have established their exclusive right to manufacture damper regulators, using diaphragms or flexible vessels of any kind. CLARK'S PATENT STEAM AND FIRE REGULATOR COMPANY, No. 117 Broadway, New York.

THE AUBIN BALLANCED

VALVE WATER METER,

(Used also for Oils and Liquors)

Is now in use by many City Water Cos., because of its low price, simplicity, durability, accuracy under any pressure, and (a great advantage) because it runs with less head than any meter used. Manufactured by H. Q. HAWLEY, Albany, N. Y.

WEST'S IMPROVED PUMPS, the most Simple, Durable, and Powerful, and the Cheapest in use.

J. D. WEST & CO.,
No. 40 Cortland street,

R. D. WOOD & CO.,

MANUFACTURERS OF

CAST-IRON PIPE, RETORTS, &c.

Office, 400 Chestnut street,

PHILADELPHIA.

Great Improvement
IN
Sewing Machines.
EMPIRE
SHUTTLE MACHINE!

Patented February 14th, 1860.

Salesroom, 536 Broadway.

This Machine is constructed on entirely new principles of mechanism, possessing many rare and valuable improvements, having been examined by the most profound experts, and pronounced to be SIMPLICITY and PERFECTION COMBINED.

It has a straight needle, perpendicular action, makes the LOCK or SHUTTLE STITCH, which will NEITHER RIP nor RAVEL, and is alike on both sides; performs perfect sewing on every description of material, from Leather to the finest Nansook Muslin, with cotton, linen, or silk thread, from the coarsest to the finest numbers.

Having neither CAM nor COG WHEEL, and the least possible friction, it runs as smooth as glass, and is

Emphatically a Noiseless Machine!

PRICE OF MACHINES,

COMPLETE:

No. 1, Family Machine, with Hemmer, Feller, Gauge, Braider, & Corder, complete. - - - $60
No. 2. Small Manufacturing, with Extension Table, $75
No. 3. Large Manufacturing, with Extension Table, $85
No 3. Large Manufacturing, for Leather, with Rolling Foot and Oil Cup, 100

One-half hour's instructions is sufficient to enable any person to work this Machine to their entire satisfaction.

Agents Wanted in all Towns in the United States, where Agents are not already established. Also, for Cuba, Mexico, Central and South America, to whom a liberal discount will be given Terms, invariably CASH on delivery.

T. J. McARTHUR & CO.,
536 Broadway.

GAS-BURNERS.

WIGHTMAN BROS.,

IMPORTERS AND

SOLE AGENTS

For the United States and Canada, of

SCHWARZ'S

GERMAN LAVA GAS-TIPS

And proprietors of Winchester's Improved

LAVA TIP GAS BURNERS,

No. 25 Kilby Street,

BOSTON, MASS.

T. G. ARNOLD,

MANUFACTURER OF

GAS-BURNERS,

And Importer of SCOTCH TIPS,

224 and 226 West 21st street,

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Mercury Cups, Portable Sockets, Burner Pillars, Burner Pliers, &c., &c.

C. GEFRORER,

Manufacturer of

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For Lighting and Heating Purposes.

GAS HEATING AND COOKING APPARATUS; FITTERS' BOVING APPARATUS, &c.

529 Commerce st., bet. Market & Arch, Philadelphia

JOSEPH LEES,

Sole Agent for the sale of

Thompson's Gas Controller

in the States of

CALIFORNIA AND OREGON,

San Francisco, Cal.

Carrington & Co.'s
GENERAL
PURCHASING
AGENCY,
In Connection with all the Expresses
No. 30 Broadway,
NEW YORK.

Established 1854.

Purchases to order any article wanted from New York, or Europe, for ladies' or gentlemen's use or wear,---comfort or luxury,---from a cameo to a cashmer, a seal ring to a steam engine.

Goods purchased at current City prices, and forwarded by Express or as directed.

Commission, Five Per Cent

Remittances, with orders, can be made by Express if preferred, as all Express Agents will take orders, receipt for and forward funds, and see to return of Goods.

THE HAVANA
MEXICAN & BRAZILIAN
EXPRESS.

CARRINGTON & CO.
30 Broadway.

Express for HAVANA and ISLAND OF CUBA by regular steamships weekly.

Express for MEXICO and VERA CRUZ on the 10th and 16th of every month.

Express for ST. THOMAS, BAHIA, and RIO DE JANEIRO each month.

Packages received for United States Brazil Squadron.

Freights should be sent to our office day before sailing of steamer, with invoice, contents and value.

FINKLE & LYON'S
New Family
SEWING MACHINE

Should be known in

IN EVERY TOWN.

To accomplish this at once and save the expense of a *Travelling Agent*, we offer thus, viz:

Any one sending us orders for two machines shall receive one machine free of charge. This proposition cannot avail after we have appointed a local agent in the town.

We have now completed our *new manufacture* at a cost of some $200,000—introducing *new patents*, and such important improvements, that without fear we are able to offer the following stringent guarantee, viz: After a fair trial, if any purchaser does not prefer the FINKLE & LYON FAMILY SEWING MACHINE to any other, he can return it and have back his money.

This machine has taken many of the HIGHEST PRIZES; *is less complicated than any other first class machine; does a wider range of work without changing; requires no taking apart to clean or oil, no "lessons" to set needle, regulate tension or operate machine.*

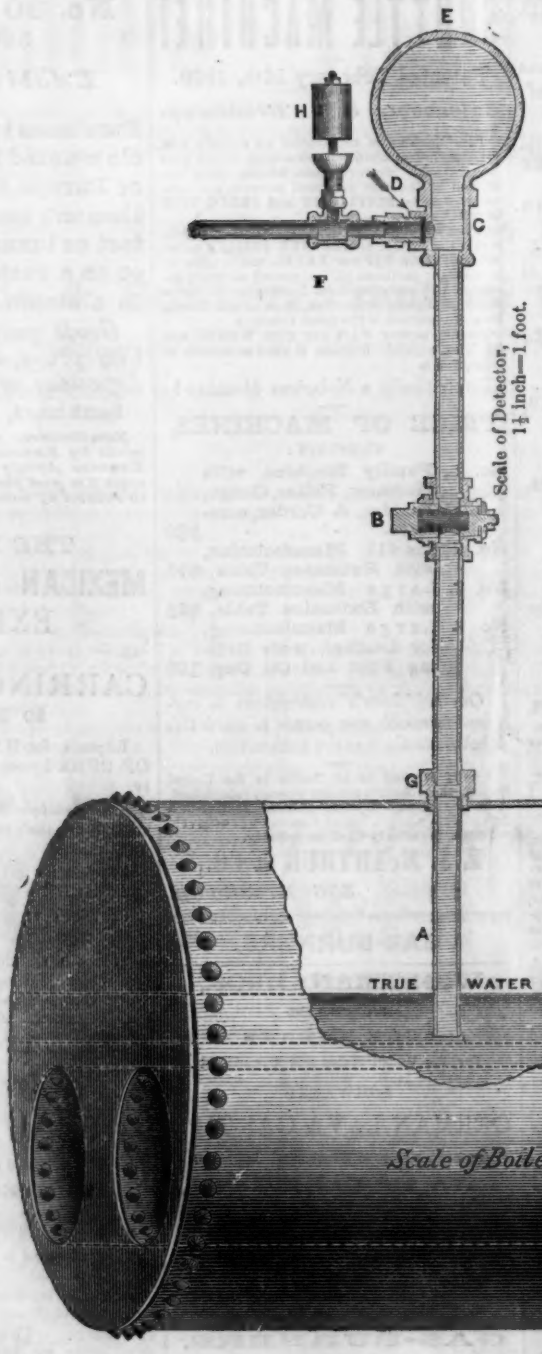
Our new Manufacturing Machine is sold on the same terms as the Family Machine.

Please send for a circular with samples of sewing.

Finkle & Lyon S. M. Co.
No. 561 BROADWAY, NEW YORK.

ASHCROFT'S

PATENT LOW WATER DETECTOR.



In a humanitarian point of view this remarkable invention is worthy the attention of the public. The certainty with which it gives warning of danger and thus wards off the impending catastrophe, is truly wonderful. In a pecuniary sense also, it will commend itself to all who own or run steam works of any kind, especially when situated in populous neighborhoods, or in which large numbers of operatives are engaged, and valuable property is centered. It is a cheap and effectual precaution against such casualties as we daily read of by explosions of steam boilers. Upon a careful examination we are convinced of the merits of this Patent Low Water Detector as invented and manufactured by Mr. John Ashcroft, 50 John street, New York.

This apparatus has qualities peculiar to itself, inasmuch as it does not depend upon any lever, spring, valve, or float, which are liable to get out of order; but it depends simply upon the inevitable law of gravitation.

The accompanying engraving and description will give a clear idea of its operation.

E, an air chamber; C, a chamber furnished with a union joint in which D, a disk of fusible alloy, is secured and made to close the opening F; B, a cock, and G a coupling by which the tube is attached to the boiler; H, an alarm whistle. The annexed cut represents the manner of connecting the Detector to the boiler, whether tubular, flue or cylinder.

The operation being simply to bore a hole at the connection, as shown in the cut, for the admission of the coupling, G, passing the pipe through until it reaches down to within one or two inches of the fire line.

The operation of this instrument is as follows: After the boiler has been filled to the water line, the pressure of the steam forces the water up into the air chamber. There being no circulation through the instrument so long as the lower end of the tube remains UNDER water, that part of the column above the cock B will be of a comparatively low temperature, and the disk D will remain solid. But whenever the water in the boiler falls BELOW the end of the tube the steam immediately displaces the water in it, and melts the fusible disk, and rushing out through the opening F, gives notice through the whistle that the water is falling to a dangerous point. To replace a disk, open the cock cautiously until the water reaches the opening at the top, then shut the cock, and when the water above it has become cool, the disk may be replaced with safety and the cock fully opened.

The explosion of Steam Boilers, from the importance of the subject, has, from the earliest period in the invention and perfection of the Steam Engine, engrossed the attention of men of the highest scientific attainments, who have endeavored to ascertain the cause that produce such disastrous effects by direct experiment. The results of their labors have, at different times, been published in the public journals of the day, and amount, in substance, simply to this—*that the explosion of Steam Boilers, with but few exceptions, have their origin in an insufficient supply of water.* It follows, therefore, that a simple, reliable instrument that will give timely warning of *low water*, will in thousands of cases, save many valuable lives and large amounts of property from destruction *caused by the explosion of Steam Boilers.*.

ASHCROFT'S LOW WATER DETECTOR

Has been in use for more than EIGHT YEARS, and more than 7,000 of them are now in use, and in no instance have they failed to give the timely warning of low-water. They require no care or attention on the part of the Engineer or the person in charge of the boiler. The object of the Detector is not to relieve the Engineer from *care* or *responsibility*, but to act as a vigilant watchman. If the attendant performs his duties faithfully, the Detector remains at rest; but if the water in the boiler is allowed to fall below the alarm water line (see cut) every person in the establishment will be notified of the fact.

Numerous written testimonials to this fact have been sent to Mr. Ashcroft; while we are informed that never, during that long period, has any one instance been known where it has failed to act.

This invention has received the sanction of the highest scientific authorities in this country. So highly is is esteemed by Admiral Smith that he has ordered it into use on all the stationary steam boilers in the Washington, Brooklyn, Charleston, Portsmouth and other U. S. Navy Yards, and this after a thorough trial and favorable report by experienced engineers appointed by government to test its merit.

The Municipal Government of Providence, R. I. (that busy centre of manufactures), some years ago passed the following ordinance in relation to it:

"RESOLVED: That this Board shall require all persons who shall hereafter be licensed to operate steam boilers in this city, to use Ashcroft's Low Water Detector."

And a long list of engineers, manufacturers and public officials have testified in the strongest and most unequivocal manner their appreciation of the excellence and utility of the invention.

MAY 7, 1867.